DOCUMENT RESUME

ED 223 341 PS 013 181

AUTHOR Blenkle, Terri
TITLE Social Modeling and Its Influence on Changing the Toy Preferences of Preschool Children.
PUB DATE 82
NOTE 129p.; Master's Thesis, California State University.
PUB TYPE Dissertations/Theses - Master Theses (042) -- Reports - Research/Technical (143)

EDRS PRICE MF01/PC06 Plus Postage.
DESCRIPTORS Age Differences; *Modeling (Psychology); Positive Reinforcement; *Preschool Children; Preschool Education; Sex Differences; *Social Reinforcement; *Toys
IDENTIFIERS Bandura (Albert); *Childrens Preferences; Observational Learning Theory; Skinner (B F)

ABSTRACT

The effectiveness of social modeling reinforcers in changing the toy preferences of preschool-age children was investigated in this document. Subjects, ranging in age from 37 to 64 months, were matched by sex and age, then randomly assigned to one of two experimental conditions or to one control condition. In the high-reinforcement condition the experimenter was expressive, inquisitive, proximate, and nurturant; in the low-reinforcement condition she was neutral, calm, relaxed, and expressionless. In the control condition the experimenter left the room and observed the child at play. Four reinforcers (affect, reward, proximity/distance, and nurturance) were assumed to be operating jointly and vicariously in the two experimental conditions. After determining the child's preferences for three toys, the experimenter announced that the subject could play with any one of them. In the two experimental conditions the experimenter played with the toy the child preferred least. Once during the 5-minute play period the subject was given an opportunity to select another toy from the complete set of three. Results concerning the effects of social modeling reinforcers, sex, and age on change in toy preference are discussed. Related materials are appended. (RH)

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SOCIAL MODELING AND ITS INFLUENCE ON CHANGING THE TOY PREFERENCES OF PRESCHOOL CHILDREN

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THESIS

Submitted in partial satisfaction of
the requirements for the degree of

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MASTER OF ARTS

in

SPECIAL MAJOR--HUMAN DEVELOPMENT

at

CALIFORNIA STATE UNIVERSITY, SACRAMENTO

1982

PS013181

SOCIAL MODELING AND ITS INFLUENCE ON CHANGING THE TOY PREFERENCES OF PRESCHOOL CHILDREN

A Thesis

by

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Abstract

of

SOCIAL MODELING AND ITS INFLUENCE ON CHANGING THE TOY PREFERENCES OF PRESCHOOL CHILDREN

by

Terri Blenkle

Statement of Problem

The model attempted to change each subject from the most preferred to the least preferred of three toys by applying Bandura's observational learning theory, during a five minute experiment. Three hypotheses were tested. First, the proportion of change due to the social modeling reinforcers assumed to be operating is expected to be in a descending order of probability from high to medium to low when comparing a high experimental, a low experimental, and a control setting. Second, the proportion of change in girls' preferences from their first choice toy to the critical toy is higher than the proportion of change in boys' preferences. And third, the proportion of change in younger children's preferences is higher than the proportion of change in older children's preferences.

Sources of Data

An Early Childhood Development Center in Sacramento, California was chosen as the site. One hundred sixteen subjects were matched by sex and age then randomly assigned to three experimental settings--the high experimental, the low experimental, and the control setting. The age range of

participating subjects was 37 to 64 months, with a mean age of 53 months. The mean age of the older subjects was 59 months. The mean age of the younger subjects was 47 months. Each subject was taken individually to the experimental room where three toys were displayed on a low table. The model demonstrated the use of each toy prior to having the subject rank-order the toys by the method of paired comparisons. Each subject's third choice toy was designated as the critical toy. It is assumed that vicarious positive reinforcement was operating in the high experimental setting as the model only rewarded herself. Here, high affect, high reward, proximity, and high nurturance were assumed to be the reinforcers. A lower level of reinforcement may have been operating in the low experimental setting as the model neither rewarded herself nor the subject. Here, low affect, low reward, distance, and low nurturance were the prevailing conditions. And, no reinforcement may have been operating in a no model control setting, due to the model's absence from the experimental room. Thus, the reinforcers, which were operating jointly in each setting, varied only in frequency and degree.

Conclusions Reached

The results of Hypothesis 1 illustrate that 54% of the subjects in the high experimental and 17% of the subjects in the low experimental and 11% of the subjects in the control setting changed to the critical toy. The data reveals that the three proportions are significantly different The

differences between the groups were significant at the .01 level. To study this in more depth, the Scheffe' method of multiple comparisons was used to compare the means of the three groups. These results show that vicarious positive reinforcement was the most effective treatment, as illustrated in the high experimental setting. The most significant difference was between the high experimental and the control setting. On Hypothesis 2, 31% of the girls as compared to 25% of the boys did change their preference. On Hypothesis 3, the results of this experiment indicate the reverse of what was predicted by showing that 32% of the older children changed their toy preference as compared to only 23% of the younger children. Neither Hypothesis 2 nor Hypothesis 3 was supported by the results of this study.

Committee Chair's Signature of Approval Mildred J. Sauvain

ACKNOWLEDGMENTS

This author finds it very difficult to briefly thank the many people who have given their time, ideas, and expertise as well as their encouragement and support during this most challenging endeavor. However, she would like to extend a "thank you" to the following very special people. An initial thank you rightfully goes to her very best friend and spouse, John. Without his encouragement and support she probably would not have had an opportunity to attempt such a goal. Thanks are also given to her family and friends whose encouragement, input, and honesty are deeply treasured.

Academically speaking, first she would like to thank the university for allowing Special Major Master's Degrees. She has been very pleased to know that colleges such as CSUS allow independent study programs. She only wishes that information about such programs be more readily available to interested students. She searched nation-wide for several years for a Master's Degree Program to her liking and here it was, right in Sacramento all the time! Completion of this Special Major Master's Degree in Human Development is the very best and most helpful endeavor she has ever attempted, both personally and careerwise.

Second, she would like to take a moment to collectively thank all of the teachers from kindergarten through college

for each adding to her knowledge and understanding of human development. Each, in his or her own way and in varying degrees, has helped immensely to put together many pieces of the puzzle of what life is all about. Although this puzzle will never be completely finished, she does have a beginning of understanding.

Third, she would like to thank her initial chairperson, Dr. Robert Schirrmacher, for allowing her total choice of classes to broaden her perspective of human development and to allow for a specialization in early childhood development. His encouragement and guidance early in this endeaver are greatly appreciated. After Dr. Schirrmacher's taking a teaching position at another university, Dr. Milad Sawiris kindly consented to become the chairperson. It is to Dr. Sawiris that she owes most of her thanks for his never ending patience, kindness, generosity, and his research expertise. She is particularly grateful to professors Dr. Cecilia Gray and Dr. Ann Bradford, members of her committee. Dr. Gray is thanked especially for her conscientious and constructive criticisms and Dr. Bradford, for her genuine concern and support.

A special thanks to three librarians--Mrs. Fuson, Gene Long, and Ed Gast--for their willingness and helpfulness with the research and to Yvonne Keaton-Martin for allowing the experiment to be conducted at the Del Paso Early Childhood Development Center.

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INTRODUCTION

This thesis is an attempt to apply Bandura's observational learning theory to changing the toy preferences of young children. The plan of this research is to address the issue of willful modification of changing of children's toy preferences through methods of social modeling, specifically, the influence of such techniques as affect, reward, proximity/distance, and nurturance. In the high experimental setting the model used vicarious positive reinforcement on herself as she applied a high degree of the four reinforcers. In the low experimental setting the model was neutral as she applied a lower degree of the four reinforcers. In the control setting the model was absent from the experimental room so no reinforcers were applied.

The Hypotheses

Statement of the Hypotheses

The following are the three hypotheses tested in this study:

1. The proportion of change due to the social modeling reinforcers assumed to be operating is expected to be in a descending order of probability from high to medium to low

when comparing a high experimental, a low experimental, and a control setting.

2. The proportion of change in girls' preferences from their first choice toy to the critical toy is higher than the proportion of change in boys' preferences.

3. The proportion of change in younger children's preferences is higher than the proportion of change in older children's preferences.

Explanation of Hypotheses 2 and 3

Hypothesis 2 was chosen based on the assumption that girls in our society are raised to be more dependent on adults which makes them less able to self-regulate their choices. Therefore, through adult interactions and/or suggestions girls will probably change their preferences more frequently than boys.

Hypothesis 3 was chosen based on the assumption that older children are considered to be mature and independent enough to make and maintain appropriate decisions because they establish internal controls. As a result, younger children in our culture are given less freedom to make choices than older children. Therefore, through adult interactions and/or suggestions younger children will probably change their preferences more frequently than older children.

Delimitations

An attempt was made to apply three major delimitations to the related research. The first delimitation was to restrict the participating subjects to preschoolers, two to six years old. The second, was to restrict the ratio by citing only research using one adult model to one child as the subject. The third delimitation was to restrict the setting to a live model setting. All three delimitations emphasized the direction of this study.

Definition of Terms

Toys

Toys are defined in Chapter 2.

Critical Toy

Each subject individually rank-ordered three toys based on his or her preference. Each subject's third choice toy was considered the critical toy.

Toy Preference

Initial toy preference was determined by the method of paired comparisons. Whether or not a subject preferred to play with the critical toy as the experiment was in progress, was the basis for measuring each subject's change in toy preference. Change in toy preference was the dependent variable.

Modeling

According to Rosenthal (1979), "modeling, . . . in its broad sense, [means] conveying information without the learner needing to directly perform the terminal acts in order to acquire correct behavior" (p. 91). Rosenthal's definition of modeling is used in this thesis.

Social Modeling

Because overt practice or demonstration is the more useful medium of social learning for young children (Rosenthal, 1979), this was the technique used in this experiment. The two social modeling factors--psychological, and psychosociological--which were applied to changing toy preferences interrelate. Each is explained separately later in this chapter. Social modeling was the treatment, or the independent variable. Social modeling is explained in more detail in the chapter on Bandura's theory (Chapter 3) and in the chapter on methodology and procedure (Chapter 4). The terms social modeling and social learning are used interchangeably.

Positive Reinforcer

Hilgard and Bower (1975) define a positive reinforcer as "a stimulus which, when applied following an operant response, strengthens the probability of that response" (p. 213). Bandura includes informational gain, incentive to learn, and discriminative learning through vicarious reinforcement in his definition of reinforcers

(McLaughlin, 1971). In this thesis both of these definitions will be used.

Vicarious Reinforcement

Bandura (1977) states that,

> Vicarious reinforcement is indicated when observers increase behavior for which they have seen others reinforced. . . . The amount of influence exerted by observed consequences, however, varies with how highly observers value the outcome and the type of behavior being modeled. (pp. 118 & 119)

Individual differences play a role in the rate and degree a subject acquires and maintains any conditioned emotional response: some subjects may, in fact, ignore or only observe the model (Bandura, 1969). Vicarious reinforcement can be operating in a setting of both positive and negative reinforcement, or any combination of these. In this thesis, vicarious negative reinforcement is not used. Vicarious positive reinforcement was operating in the high experimental setting.

Observational Learning

Observational learning is governed by four component processes: attention, retention, motor reproduction, and motivation (Bandura, 1977). According to McLaughlin (1971), Bandura argues that,

> Much social learning occurs through mere observation. A person need not be [directly]

> reinforced in order to learn--he [or she] can experience reinforcement vicariously through the mediation of social models. (p. 75)

If the model reinforces herself or himself, the subject internalizes this vicariously through observational learning, provided the subject has attended to stimuli, uses retention, uses skills of mobility, and has the incentive to perform a modeled act.

Reinforcers Assumed to be Operating in this Experiment

For this experiment, the independent variable of social modeling consisted of four major reinforcers: affect, reward, proximity/distance, and nurturance. The manner and degree in which each reinforcer was incorporated within this experiment will be explained in more detail in the chapter on methodology and procedure (Chapter 4). This information on reinforcers applies primarily to the high experimental setting because the model in the low experimental setting was neutral and the model in the control setting was absent.

The first reinforcer, high affect, was defined as the model's degree of expressing likes and preferences of fundamental characteristics or qualities of the critical toy such as novelty, color, size, and shape. In the high experimental setting she indicated vicariously the amount of pleasure received by affectively exhibiting body actions, gestures, facial expressions, and verbalizations to the subject.

The second reinforcer, high reward, also encompassed the likes and preferences of the critical toy by the model's manipulation of the various items, but, the process of drawing comparisons and making designs was an extension of merely indicating enjoyment. This author prefers the process of manipulating items within a toy rather than making an end product. Therefore, reward was defined as the model's performing body actions and making remarks that were contingent upon the liking of a particular accomplishment. Rewards included such actions as drawing comparisons of the items within the critical toy on a cognitive level and/or by making a design by possibly arranging the items in a specific sequence that was aesthetic, mathematical, or pleasing and rewarding to the model in other creative ways. The term mathematical included counting the items, making geometric patterns, and/or dealing with fractions and equations.

The third reinforcer was proximity/distance. It was denoted as the actual toy placement. In the high experimental setting the critical toy was placed close to the subject's first choice toy and the reinforcer was referred to as proximity. In the low experimental setting the critical toy was placed farther away from the subject's first choice toy and the reinforcer was referred to as distance.

The fourth reinforcer, high nurturance, was defined as the degree of warmth, friendliness, and emotional support the model relayed to the subject while playing with the critical toy.

Related Research

Historical View of Research on Toy Preference and Change in Toy Preference

Research on toys, or play materials as they were called in early studies, dates back to 1898 (Van Alstyne, 1976). From the late 1890's until the mid-1930's groundwork for research on preschool children's toy preferences was reported in only a few books and research studies. Each added to and improved on former works through the methods of observing and recording such aspects as the physical qualities of toys, toy preference, attention span, toy usage, and interactions with peers and adults while playing with toys. From the 1930's until about the mid-1970's the main factors studied also included frequency of toy usage, how toys were manipulated, the educational value of toys, and the social relationships of children as they played with toys. In the early 1960's a few researchers began to study change in toy preference. With the advent of television and computer technology, research on vicarious reinforcement has come into being. Most notable are studies done by Bandura using live and especially filmed models to influence children by manipulating a variety of variables.

Psychological Factors Related to Change in Toy Preference

All in all, manipulation of psychological variables on a one to one basis, with only the experimenter and the subject present, was the major criterion for classifying

research in this category. Studies of the psychological factors related to toy preference include variables such as attention or awareness of a toy, satiation or the satisfaction to the point of boredom, distinctiveness or distinguishing qualities of a toy, novelty, salience or prominent qualities of a toy, and the degree(s) of threat used to change a subject's toy preference. Some issues studied in conjunction with various psychological factors include the appropriateness of choices based on the age and sex of subjects. Other issues studied are parental choices and attitudes. There are studies on the learning or educational value that can be derived from toys. In other studies, innumerable factors which interrelate and affect the sensory and motor activity of subjects as well as their motivation have been conducted. One line of research within this area concerns the subject's reactions to a forbidden toy. In these studies negative rather than positive reinforcement was administered.

Although the dissonance theory was tested in each of the three research articles cited in this section, it was overshadowed by studying such variables as attention, satiation, novelty, unavailability, distinctiveness, threat, and saliency. In each experiment the subject was left alone in an experimental room for a few minutes after one type of reinforcement was administered. Then, the subject re-ranked the toys in order of preference so the change in toy preference could be measured.

Cognitive dissonance, its explanation and causes, is the subject of Aronson and Carlsmith's (1963) research using varying degrees of threat or negative reinforcement in an attempt to change toy preference. As predicted, the critical toy did decrease in value in the mild threat condition. There was one puzzling result, however, which contradicted the dissonance theory: in the severe threat condition the subjects actually increased their liking of the critical toy. It was not known if severe threat or some other factor was the cause for the ambiguity. A no-threat condition, in which the critical toy was removed from the room, was administered to a random sample of subjects who were in the original experiment in an attempt to determine the cause. Thus, Aronson and Carlsmith's research actually consisted of two experiments. The first tested the dissonance theory and the second attempted to correct the weaknesses in the first experiment. The results of the second experiment were the same as the severe threat results indicating that the degree of threat was not the primary factor involved. Instead, the increase in attractiveness of the critical toy seems to be due to satiation with the other toys, value placed on the critical toy by the model, or some other unknown factor that is common to both the strong and mild threat conditions.

Research by Turner and Wright (1965) was an attempt to determine reasons for increase in attractiveness of a forbidden object. For the first experiment they basically did a replication of Aronson and Carlsmith's (1963) study

with some modifications and improvements including the recording of changes in the attractiveness of toys due to varying types and degrees of threat manipulated. For the second experiment they studied satiation, novelty, attention, distinctiveness, and the unavailability of the preferred toy in an attempt to explain weaknesses of the dissonance theory. They tested three hypotheses: the satiation-novelty hypothesis, the attention-distinctiveness hypothesis, and the unavailability hypothesis. When the results of both experiments were compiled, Turner and Wright concluded that if an object, or the critical toy, is to be permanently unavailable, cognitive dissonance can reduce the desirability of the object. However, when an object is temporarily unavailable its value tends to increase, thus, supporting the satiation-novelty hypothesis.

In a modified replication of Aronson and Carlsmith's classic (1963) research of the forbidden toy paradigm, Ebbesen, Bowers, Phillips, and Snyder (1975) conducted two experiments. The first experiment was to examine whether less frustration was related to detraction rather than cognitive dissonance. The toys for the first experiment were classified as small spread (similar), large spread (dissimilar), or a combination of large and small spread. In this study, one of three levels of negative reinforcement--low threat, moderate threat, or high threat--was administered to each subject. Then, a random sample of subjects within the three levels of punishment was used for the control group. In this, the control

setting, whatever level of threat had been administered was negated and these subjects were allowed to use all the toys. The rest of the subjects, all of whom remained in the negative reinforcement situations, were forbidden to play with their second choice toy. The results of this experiment were similar to Aronson and Carlsmith's research. More subjects in the high threat condition devalued the forbidden toy when the spread of toys was small. When the spread of toys was large, fewer subjects in the high threat condition devalued the forbidden toy.

A different sample of subjects from the same general population participated in the second experiment. Only small spread toys were used while threat and saliency were manipulated in order to test a self-control hypothesis which suggests that devaluation results when subjects attempt to cope with frustration during a period of temptation. The other two theories tested were the dissonance theory and the self-perception theory. There was no control group, instead, all subjects received negative reinforcement. The second ranked toy was the forbidden toy. This experiment's results indicated that high-threat had a greater influence on both verbal and behavioral devaluation of toys when the subject's attention was not directed at liking the forbidden toy. The results confirm the findings of the small spread conditions in the first experiment. It seems that self-control is one important factor that lessens the frustration of subjects in tempting situations.

As such, self-control appears to play a larger role than dissonance or self-perception.

Psychosociological Factors Related to Change in Preference

Psychosociological factors include psychological factors plus the presence of two individuals interacting on a one to one basis. Such studies on change in preference of preschool children have been conducted in the United States, Japan, Canada, and Germany. Sukemune, Haruki, and Kashiwagi (1977) state that in recent years Japanese psychologists have conducted various studies of observational learning and imitation, particularly social learning. When comparisons were made between United States and Japanese research vicarious reinforcement was studied with a between-subject design in both countries. Second, generally speaking, research findings in both countries have been inconsistent. And third, nurturance is a recent variable that has been studied in both Japan and the United States. Research conducted in the United States includes various factors and processes that underly the mechanisms of observational learning, such as social factors, mediational processing, vicarious reinforcement, and model and observer relations. Within the category of social factors, Japanese observational learning studies were initially conducted in the field of discrimination learning. Statements in their article concerning the delimitations set for this research was the basis for limiting 58 articles initially cited by

them to only 18 (see Appendix A). Of the 18 articles cited, 12 relate directly to this thesis. The 18 articles were classified in the following categories. Five studies were under the heading, content of observational learning. Three articles were under each of the two headings, learning by observing vs learning by performing and effects of vicarious reinforcement. Two articles were under the heading, model's characteristics: relationship between model and observer. And, one article was under each of the headings, observer learning and analysis of mediational process.

Psychosociological factors related to change in preference were studied in a two part experiment conducted by Masters, Anderson, and Fitzpatrick (1975). In the second part of their experiment, the subject observed the controller model then the rival consumer each perform a different sequence of 13 preferences and behaviors. To measure the effectiveness of observational learning, the subject was left alone for three minutes as an observer unobtrusively noted which preferences and behaviors were performed. This was followed by casual questioning by a different adult to determine which preferences and behaviors were observed though not acted out by the subject during the three minutes she or he was alone. The results show that the controller was imitated more than the rival consumer only when the subject received more nurturance than the rival consumer.

Various aspects of change through the use of vicarious reinforcement have been studied with young children as the subjects. Thelen and Rennie (Maher, 1972), categorize research on vicarious reinforcement into two types. The first category is one-level vicarious studies in which all the subjects are given the same degree of reinforcement. The second category includes research on the effects of different degrees of vicarious reward. The authors further divide vicarious reinforcement into other groups such as studies done within the nonalternative-trials design. Here, the subject is exposed to the entire sequence of modeled behavior prior to having the opportunity to respond. In this discussion of related literature only studies that are one-level vicarious studies which have been conducted within the nonalternative-trials design will be included. According to Thelen and Rennie, the majority of research pursued by Bandura and his co-workers is within this category.

Psychosociological Factors Related to Change in Toy Preference

Studies on the relationship between psychosociological qualities of toys and change in toy preference include techniques such as social modeling. In one such experiment, Zimmerman (1976) conducted research on affect and rewardingness using toys as the medium of study. In his research, affect is defined as the model's speech, actions,

and facial expressions. Rewardingness is defined as the model's conversation and interactions with the subject as the subject played with a puzzle. Zimmerman separately measured each of the two variables in an attempt to determine whether or not cognition plays a role in changing the toy preferences of preschool children. For each of the variables, there was an interaction phase, a modeling phase, and a posttest. Vicarious positive reinforcement may have been operating in the high affect and in the high rewardingness treatments. Low reinforcement may have been operating in the low affect and in the low rewardingness treatments. In addition, there was a no model control setting consisting of no reinforcement. The results indicate that vicarious positive reinforcement of high affect can increase the number of subjects who change to a previously disliked toy as well as actual imitative play with the toy. However, the results on rewardingness indicate that vicarious positive reinforcement of high rewardingness does not significantly affect any change to a previously disliked toy or affectively to the model. Zimmerman concludes that the results support the hypothesis that cognition plays a role in changing the toy preferences of preschool children.

Zimmerman and Koussa (1979), studied two aspects of vicarious reinforcement on children, namely a model's affective cues and a model's rewardingness, as they applied Bandura's observational learning theory. In their related

literature they stated,

> There is some evidence. . . that rewarding models are readily imitated. . . . [And,] it appears that a model's rewardingness is an important aspect of vicarious experience. . . . [Also,] it appears that both a model's rewardingness and a model's affective cues influence children's amount of imitation. (p. 56)

Results indicate the interaction of affect and rewardingness is very complex. It seems that modeling, especially affective modeling, plays a significant role in changing toy preferences. In addition, rewardingness slightly influences children's toy preferences. When low affect modeling is combined with rewardingness boys are more easily influenced than girls. Again, as the results of Zimmerman's (1976) research seem to indicate, Bandura's theory is endorsed. Here, situationally-specific cues, which are termed cognitive, are considered to be the basis for a high degree of selectivity in children's vicarious learning. Because of the results of Zimmerman and Koussa's research, affect and rewardingness are considered very closely related and are not studied separately in this thesis.

Research Pertaining to the Reinforcers Assumed to be Operating in This Study

In their research, Zimmerman and Koussa (1979) illustrated high affect through the model's speech, actions,

and facial expressions as he enjoyed using the critical toy. In contrast, in the low affect condition the model was nonverbal and expressionless as he slouched in posture while playing with the critical toy. For this experiment this author's definition of affect differs from Zimmerman and Koussa's in the low experimental setting by the model's not slouching in posture. Also, the model used less verbalizations which were expressed at a lower level of affect, rather than no verbalizations, in the low experimental setting. (See the definition of reinforcers in the definition of terms section.)

In Zimmerman and Koussa's (1979) research the high rewardingness model conversed with the subject about a wide variety of potential topics as he helped the subject put a puzzle together. Also, prior to leaving the experimental room, the model gave the subject a piece of candy. In contrast, the low rewardingness model acted like a stranger to the subject by interacting as little as possible, reading a newspaper while he sat about four feet away as the subject played with the puzzle. For the experiment for this thesis, the reinforcer termed reward is defined differently than Zimmerman and Koussa defined rewardingness. (See the definition of reinforcers in the definition of terms section.)

Nurturance was referred to as a combination of affect and reward by Masters, Anderson, and Fitzpatrick (1975). They defined affect as the model's warmth and friendliness

in the high controller nurturance condition while they defined it as deprecating and curt comments in the low controller nurturance condition. In research done by Morris, Sharkey, and Redd (1979) one factor facilitating the process of observational learning was nurturance by an adult model. Based on their study of related literature, they divided the effects of nurturance into the categories of non-incidental imitation and incidental imitation. They stated that the majority of recent research deals with incidental imitation, which was the course of action they pursued. In their research, nurturant interactions consisted of visual regard, smiles, and positive, supportive verbal comments relayed at 15 second intervals contingent on the subject's starting to perform the task of sorting tokens. Each subject was initially allowed to choose her or his preferred adult model. For the experiment for this thesis nurturance was defined as the degree of warmth, friendliness, and emotional support the model relayed to the subject while playing with the critical toy.

In contrast to research done by both teams of researchers (Masters, Anderson, & Fitzpatrick, 1975 and Morris, Sharkey, & Redd, 1979) this author chose to refer to both affect and reward as separate reinforcers. Also, the role of the adult model was assigned to one model. And, the variable of social preference was omitted in the experiment for this thesis. Instead, all four reinforcers--affect, reward, proximity/distance, and nurturance--were assumed to

be jointly operating as the variable termed social modeling. As a result, the effectiveness of the assigned adult model's role was measured by change in toy preference.

In summary, vicarious positive reinforcement was assumed to be operating in the high experimental setting by the model who only rewarded herself. Low reinforcement was assumed to be operating in the low experimental setting as the model neither rewarded herself nor the subject. And, no reinforcement was assumed to be operating in the control setting due to the model's absence from the experimental room (see Table 1).

Table 1
The Three Settings and the Reinforcers Assumed to be Operating in Each

High Experimental Setting	Low Experimental Setting	Control Setting
Vicarious positive reinforcement— model only rewarded herself	Low reinforcement— model present but neutral	No reinforcement— no model
Reinforcers operating— High affect High reward Proximity High nurturance	Reinforcers operating— Low affect Low reward Distance Low nurturance	Reinforcers operating— No reinforcers were operating

TOYS

What Are Toys?

Over the years many definitions of the word toy have been collaborated. The Oxford English Dictionary (1933), defines it in a concrete sense as,

> A material object for children or others to play with (often an imitation of some familiar object); a plaything; also, something contrived for amusement rather than for practical use (esp. in phrase a mere toy). . . . That is a toy [when the word toy is] applied to small models or imitations of ordinary objects used as playthings, as toy boat, cannon, dog, engine, horse, house, man, train, trumpet, woman, etc. (p. 209)

This author would like to add a few more elements to the definition of toy. First, the word toy can mean something entirely different to two given individuals. What is a toy to one person may not necessarily be a toy to another person. Second, what is a toy is based primarily on each person's attitude or mood at any given point in time. Each individual may view a specific thing as a toy at one time but not as a toy at a different time. Third,

amusement derived from toy usage can stimulate an attitude of enjoyment and contentment as well as humor. Fourth, the person using the toy may be very serious while playing with the toy. And fifth, each person may play with a toy differently.

Based on this expanded definition of a toy, many things can be considered toys. The world of toys is fascinating! Their appeal is so universal that boys and girls as well as women and men of all ages, all levels of ability, all races, all religions, and all cultures use them deliberately and spontaneously. Yet, what actually is a toy is dependent on the mental attitude of the person while engaging in a specific activity. By having no boundaries or limits on what a toy is, one can creatively and imaginatively enter and make discoveries in the limitless world of toys. The following quotation by Newson and Newson (1979) says the same things but in fewer words,

> Anything is a toy if I choose to describe what I am doing with it as play . . . [however,] it does not help us very much when it comes to identifying what objects were originally made with the purpose of play in mind. (p. 119)

These same authors refer to toys as people and/or things throughout their book. By using the term person (or primary caregiver) as a toy, Newson and Newson see the primary caregiver as an infant's earliest toy.

As the child progressively and mutually withdraws from the primary caregiver, she or he becomes more interested and receptive to what is generally known as "toys," or things (Newson & Newson, 1979). So it is that as the child continues to grow and to mature, his world of toys expands more and more into the realm of two fundamental categories--people and things. Both categories of toys constantly overlap in various manners and degrees, changing in rank order or status, depending on what is available at the time and what interests the child at the moment. Thus, there is an ever shifting as well as an overlapping of the concept of toys from moment to moment from infancy onward.

By using a concrete definition of toys as things, Alexander Pope, in his "Essay on Man" states the need for people of all ages to have and to enjoy toys at each and every stage of life as he writes the following:

> Behold the child, by Nature's kindly law
> Pleased with a rattle, tickled with a straw:
> Some livelier plaything gives his youth delight,
> A little louder but as empty quite:
> Scarfs, garters, gold amuse his riper stage,
> And beads and prayer-book are the toys of age.
> Pleased with this bauble still, as that before,
> Till tired he sleeps, and life's poor play is o'er
> (Foley, 1962, p. 10).

Spilhaus (1980), the famous scientist and inventor, acknowledges the universiality of toys as work and/or play

for all ages of people throughout the history of man when he writes,

> We learn from toys how little the amusements of children have changed; how little the amusements of adults differ from those of children, except for purity of delight; and how toys are the additive to preserve our childish enchantment with magic, wonder and play. Historically, toys were never intended to be just for children. (p. 163)

Narrowing down the definition of toys more to include only concrete toys for children, one often comes across definitions like the following, "Play is the lifework of childhood, and we only guess the degree to which toys--the instruments of play--have raised the taste, imagination, and character of their young owners" (Freeman & Freeman, 1962, p. 7). Such a definition of toys puts limits on toys by just classifying them in the category of things. It also implies that toys are strictly for children and their educational value is of primary importance. As explained by Frederick (1977) and others, it should be noted that there are differing views of whether or not toys for children should be labeled "educational."

Piaget believed that toys can play numerous roles in the lives of young children. The types of toys most frequently used in Piaget's experiments consist of anything that has many similar but not necessarily matching parts: the items within a specific toy may differ in size, color,

shape, etc., yet they are similar enough in at least some qualities to encourage children to classify the items any way they choose. To elaborate, this author chose five concepts which are basic to toys used in Piaget's research (Beard, 1969; Duckworth, 1973; Pulaski, 1971; and Schwebel & Raph, 1973). These criteria served as guidelines for choosing the three toys, and for the model's toy manipulation, for this experiment. They are the use of 1) a large number of items within each toy, 2) items within a toy that may be either recognizable or not recognizable, 3) items within a toy that are graduated in size, 4) toys that are not self-correcting, and 5) the idea that the process of manipulating the items within a toy may be more important than making an end product.

The first three criteria which are based on Piaget's research are very closely related. The first criterion implies that a toy usually consists of at least two or more (though preferably five or more) physical, tangible, and concrete items. In reference to the second and third criteria, Piaget used a wide variety of things, usually of graduated sizes, such as pennies, small plastic animals, unit measure blocks, and cardboard figures each representing a person. Toys with geometrically shaped items, or toys with non-descript items, are implied to be just as valid as toys with recognizable items. The fourth criterion carries Piaget's concept of a toy further. Toys which vary in size and shape are often referred to as

open-ended or unstructured. Because the items that make-up such a toy have some similar and some dissimilar qualities, they may be categorized in innumerable ways so that there is no right or wrong way to use the toy. Also, the many items allow a child to stop or be stopped at any time without feeling the toy needs to be "completed." The fifth, and last criterion, refers to the process of using a toy. It carries Piaget's concept of a toy even further. Here, the process, more so than the end product, is very important to the child as he or she becomes more and more interested in making logical as well as illogical sequences and patterns while organizing the items within a toy at will.

Piaget's beliefs are aptly stated by Newson and Newson (1979) in the following quotation:

> We should not insist that a child plays with a toy 'correctly', for in working through its different possibilities she [or he] will be making her [or his] own scientific discoveries. Eventually she [or he] is going to need the concepts of categorizing, grading and sorting, into shapes, sizes and so on, in order to acquire the basic skills of reading and writing; but she [or he] will need even more the repeated experience that by exploration, maybe in the company of a helpful but not too interfering adult, she [or he] has the power to find out things for herself [or himself]. (p. 68)

Application of these five criteria encourages a child to manipulate toys in many ways, thus, potentially gaining more skills and knowledge basic to later learning. Toys which comply with the five criteria are appropriate and applicable to the ability level, skills, and interests of a wide age range of children. To ensure suitability, the five criteria previously stated served as guidelines for selecting the three toys for this experiment. This eliminated the necessity of finding out the developmental level of each subject.

In summary, a toy can have a very complex and involved definition. A toy can be any stimulus which a child may or may not learn from at any given moment as she or he manipulates it, or any part of it, alone or with others. As a result, potentially, a child can respond and/or interact with a toy intellectually, creatively, socially, or emotionally through the senses.

Toys Used for this Study

The "felt shape" toy consisted of a flannel board with 60 felt shapes. The play area was a flannel board (38.10cm X 68.58cm) of a solid medium brown felt glued to a carpet sample frame. The items to manipulate were three felt shapes (squares, circles, and triangles) each of which was in four gradient sizes measuring 2.54cm, 5.08cm, 7.62cm, and 10.16cm. The triangles were the diagonal half of the square,

in size and shape. One of each of the secondary colored shapes, of all four sizes, was purposely omitted to lessen the total number of pieces because a pilot study revealed that there were too many pieces in the original "complete" set for this size flannel board. A description of the felt shape toy follows:

blue--4 squares, 4 circles, 4 triangles . . . 12 pieces
red--4 squares, 4 circles, 4 triangles. . . . 12 pieces
yellow--4 squares, 4 circles, 4 triangles . . 12 pieces
green--4 squares, 4 triangles . . . . . 8 pieces
orange--4 circles, 4 triangles. . . . . 8 pieces
purple--4 squares, 4 circles. . . . . 8 pieces
totaling . . . 60 pieces.

The "colored block" toy consisted of 49 colored blocks to manipulate on a felt covered tray. The box for this toy states that there are 49 blocks, however, the items included match the ones in the picture on the box and both total 51 blocks. The two yellow triangles were not used so that each shape and size of item was a different color. A plastic tray (35.56cm X 26.67cm) with a solid brown piece of felt attached on top was the background for this toy. Squares, rectangles, triangles, and cylinders were the items to be manipulated. A description of the colored block toy follows:

blue squares--(4.45cm X 4.45cm X 1.59cm) . . . 16 blocks
red rectangles--(8.89cm X 4.45cm X 1.59cm) . . 5 blocks

yellow cylinders--(8.89cm X 2.22cm
in diameter) . . . . . 4 blocks
green rectangles--(8.89cm X 2.22cm
X 2.22cm). . . . . 4 blocks
orange rectangles--(4.45cm X 2.22cm
X 2.22cm). . . . . 10 blocks
purple cylinders--(4.45cm X 2.22cm
in diameter) . . . . . 10 blocks
totaling. . . 49 blocks.

The "golf tee" toy consisted of 72 golf tees to be inserted in a raised pegboard. The raised pegboard (29.21cm X 16.51cm) was placed on a plastic tray (35.56cm X 26.67cm) which had a solid brown piece of felt attached. The pegboard had 66 holes of which 62 were accessible for the subject to insert golf tees. It had 11 holes by six holes, each 2.54cm apart. The four corner holes had nuts and screws which raised the pegboard 2.54cm. A description of the golf tee toy follows. The items a subject could manipulate were golf tees of six colors in three sizes--small (4.76cm X 1.27cm in maximum diameter), medium (5.40cm X 1.27cm in maximum diameter), and large (6.99cm X 1.27cm in maximum diameter).

There were four golf tees of each color and size --
blue--4 small, 4 medium, 4 large . . . . . 12 golf tees
red--4 small, 4 medium, 4 large. . . . . 12 golf tees
yellow--4 small, 4 medium, 4 large . . . . 12 golf tees
green--4 small, 4 medium, 4 large. . . . . 12 golf tees

orange--4 small, 4 medium, 4 large . . . 12 golf tees

pink--4 small, 4 medium, 4 large . . . . 12 golf tees

totaling . . 72 golf tees.

Photographs of the toys used for this experiment are in Appendix B.

BANDURA'S THEORY

Historical Perspective

Although Skinner states that mental life has received stronger support than behaviorism, Rosenthal (1979), for one, contradicts this statement saying that mentalistic events were considered taboo earlier in this century. In essence, historically speaking, the studies and theories on modeling and social learning are considered to be in their infancy (McLaughlin, 1971). Rosenthal further states that in ancient times a vast range of modeling techniques were used in educational settings, however, such teaching methods were discontinued until about the middle of this century. In 1954 Rotter did some preliminary studies by attempting to apply general learning theory to the complex social behavior of humans (Khan & Cangemi, 1979 and McLaughlin, 1971). First imitation, then modeling, became topics of serious theoretical and empirical concern in the 1960's. Along with the interest in imitation and modeling, social learning theories began to be referred to as mediational theories. Rosenthal (1979) explains that, "what Bandura and his coherts did was to show that the widest diveristy of human behavior can be acquired or changed by exposure to modeling" (p. 91).

The former unidirectional view of behavior evolved into a view of reciprocal determinism which consists of three interlocking determinants of behavior (see Figures 1 and 2). As the schematic views show, personal influences were dropped from the schematic view of behavior and the concept was revised to include perception along with behavior and the external environment as reciprocating determinants influencing individual behavior and behavioral change. Thus, according to Bandura and others, social learning theory consists of three reciprocating factors which determine social learning, namely--perception or cognition, behavior, and the external environment.

$$B = f \ (P \rightleftharpoons E)$$

Figure 1. A schematic view of the concept that behavior (B) is unidirectional while personal (P) and environmental (E) influences are bidirectional (Bandura, 1977, p. 9).

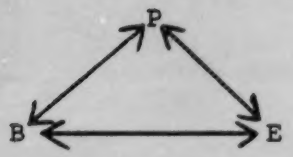

Figure 2. A schematic representation of the social learning process called reciprocal determinism. Perception (P, which is also referred to as cognition or mediation), behavior (B), and environmental (E) factors all operate as interlocking determinants of each other (Bandura, 1977, p. 10).

Bandura's Vantage Point

As a social learning theorist, Bandura considers the external environment, behavior, and cognition as equally important factors in the study of learning. Here, cognition refers to what is described as inner controls or mental life. Bandura (1977) states that due to an individual's cognitive abilities, his or her behavior is regulated antecedently. Bandura's theory assumes that each individual learns from previous external, vicarious, and self-generated experiences by mentally remembering whether or not the consequences were rewarding, punishing, or neutral. As future events and situations arise they are effected by mental anticipation of past outcomes. The major assumption within Bandura's social learning theory is

that of the three reciprocating factors, cognition is the factor which has far greater influence. As stated by Bandura (1974),

> People change more rapidly if told what behaviors are rewardable and punishable. . . . Competencies that are not already within their repertoires can be developed with greater ease through the aid of instruction and modeling than by relying solely on the successes and failures of unguided performance. (p. 862)

For one thing, Bandura explains that a recent development in theoretical perspective has acknowledged the importance of human thought, affect, and behavior. As a result, mediation or cognition has a prominent role equal to behavior and environmental influences in acquiring and regulating human behavior within the realm of social learning theories. Along with this, he and other social learning theorists of today stress the importance of empirical facts rather than attempting to pull their many ideas together into one all-encompassing higher order theory. In doing so, the primary concern is to understand human behavior and all its complexity within a social context.

All three factors--the external environment, behavior, and cognition interact. And, any one or all three may be the overriding factor: as a result, there are four possible ways that the reciprocating factors can determine social learning. Also, within the reciprocal factor of cognition,

each person perceives things in his or her own unique way based on one or a combination of four methods from direct experience, observation, judgments made by others, and/or logical verification. The key to Bandura's social learning theory is the reciprocal factor of cognition or perception. Through perception, each person is free to cognitively choose how she or he perceives any and all situations. Each situation is independently influenced by the interactions of the three reciprocating factors as the person perceives the situation at hand. And, a person's overall perception is based on a balance of all three reciprocating factors which may be similar or dissimilar to the perception of any one particular situation (Bandura, 1977 and 1978).

To take this a step further, Bandura (1977) thinks that each of the determinants has a counterpart which acts as a process that not only gives incentive but also functions as a regulator in determining overt behavior. The counterpart of the external environment is called reinforcement. The counterpart of perception, or cognition, is called symbolism. And, the counterpart of behavior is called self-regulation (which is also termed anticipated reinforcement). How the processes of reinforcement, symbolism, and self-regulation interact to produce behavior and behavioral change is illustrated in Figure 3.

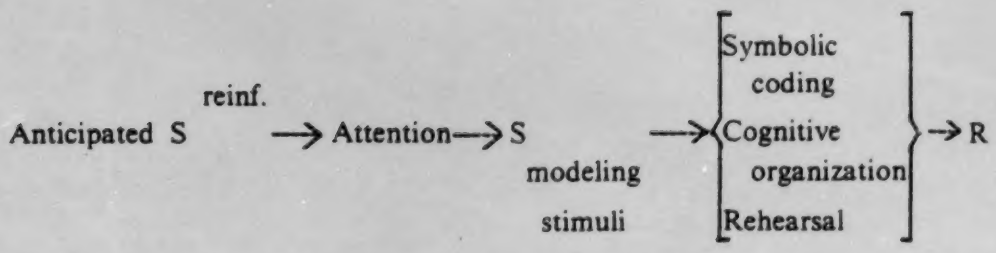

Figure 3. A schematic representation of how reinforcement influences observational learning according to social learning theory (Bandura, 1977, p. 38).

The Process of Reinforcement

The first process, reinforcement, was formerly considered to merely be an automatic and mechanical response strengthener. Today, however, two basic concepts cause differences in opinion among social learning theorists concerning the manner that reinforcement affects observational learning. The first is due to the difficulty of determining whether reinforcement creates new behavior or whether it activates what was already partly learned through observation. To quote Bandura (1977), "Because reinforcement influences ordinarily occur together with numerous behavioral examples to draw upon" (p. 22), this makes it difficult for social learning theorists to determine whether the exact causes of modeled behavior are due to internal, external, or both internal

and external reinforcement. Bandura thinks that observational learning occurs mainly through the internal incentive values of information (or symbolism) and motivation (or self-regulation) occurs mainly within the basic principle of reciprocal determinism. Second, and in conjunction with this, reinforcement is considered by some social learning theorists as a facilitative condition, or process, which causes individuals to attend to modeled activities. Bandura's thinking in the interactional principle of reciprocal determinism is a prime example of this. More specifically, although Bandura thinks in terms of reciprocal determinism and the process of reinforcement, he would prefer to replace the word reinforcement with the word regulation because he believes, in actuality, that reinforcement regulates, rather than causes behavior by its consequences.

Bandura is one theorist who does not think of reinforcement as it is usually defined--direct reinforcement. Rather, he thinks in terms of indirect reinforcement in which the model may or may not be rewarded. As Bandura (1974) states, "all learning phenomena resulting from direct experience can occur on a vicarious basis by observing other people's behavior and its consequences for them" (p. 864). According to this viewpoint, indirect reinforcement can operate in three manners. One is vicarious reinforcement which means that the observer is present but only the model receives direct

reinforcement. Bandura (1977) defines vicarious reinforcement broadly by interpreting it to also include less obvious aspects such as the model's characteristics, the model's type of behavior, the reinforcing agents operating, "the type of intensity of consequences, their justifiability, the contexts in which they occur, and the reactions of models to the outcomes they experience," (p. 124) plus any additional aspects which are unique to a given setting and situation that may influence behavior. According to McLaughlin (1971), because Bandura thinks all learning can occur vicariously he is often said to be a contiguity theorist, or one who thinks in terms of no direct reinforcement.

The Process of Symbolism

The second process, symbolism, consists of visual (or imagined) and verbal coding of information. It seems that initially a child primarily uses visual coding, then later, as the child grows and matures, verbal coding is relied on more (Khan & Cangemi, 1979 and Rosenthal, 1979). Of the two, Bandura thinks that verbal coding is more dominant because an individual can retrieve and reproduce modeled behavior more rapidly through verbalization (McLaughlin, 1971). Through the process of symbolism, imagined and verbal symbols serve an informative function of imparting information about ways to deal with the environment. Examples include which external events will

be attended to, how they will be perceived, whether or not they will have any lasting effects, the degree and capacity of their effectiveness, and how this information will be organized for retrieval at a later date. Because of man's extraordinary ability to use symbols, he is able to represent events, to analyze conscious experiences, to communicate with others through time and space, as well as to plan and engage in foresightful actions through the use of skills such as imagination and creativity (Bandura, 1977).

Bandura and others resort to cognitive, or mediational, processes to bridge the gap between observation and behavior by attempting to explain the role of observational learning in developing new response patterns (McLaughlin, 1971). In doing so, they state that through cognition and the acknowledgment of vicarious reinforcement, an individual makes social comparisons by not only seeing the rewarded, discarded, or punished consequences of a model but also by evaluating the outcome observed while relating this information to his or her own personal experience. These judgments in turn, aid an observer in choosing and overtly displaying behavior and behavioral changes (Bandura, 1974). To elaborate, McLaughlin (1971) explains Bandura's viewpoint by stating the following:

> Responses can be learned even though the observer does not overtly perform the model's responses

> during the acquisition phase ('no trial' learning) and in cases where neither the model nor the observer are reinforced. Such phenomena . . . indicate the importance of perceptual and other symbolic processes in imitative learning. Through observation of the modeling stimuli the observer acquires internal representational responses that mediate subsequent behavioral reproduction. (p. 136)

As a result, Bandura (1977) thinks that behavior is learned and changed symbolically largely through the intervening influence of thought before it is performed, because an individual must be aware of what is being reinforced. Very briefly, as a contiguity theorist, Bandura believes that ideas expressed together tend to become associated. As McLaughlin (1971) states, Bandura does "not regard [direct] reinforcement as necessary for learning [rather] imitative behavior is acquired simply through stimulus contiguity (S-S learning) and symbolic mediation" (p. 137).

The Process of Self-regulation

The third process in the principle of reciprocal determinism, self-regulation, plays a prominent role in social learning theory. Although it is given equal weight for causing behavior and behavioral change, both of the

other processes, reinforcement and symbolism, are essential for enabeling an individual to reach the highest level of development, self-regulation. By way of self-produced consequences through reinforcement and by way of self-evaluation through symbolism, performance standards are internalized through the motivational function of self-regulation. In this process, external consequences, or reinforcement, mainly have antecedent influences by causing anticipation of foresightful action and they have the greatest influence on behavior when the external consequences coincide with self-produced or anticipated consequences (Bandura, 1974 and 1977). By studying the causes of social incentives and social reinforcers, researchers can gain knowledge and understanding about human behavior and behavioral change through positive means. This information can, in turn, be applied to social learning as well as to improving human relationships on a daily basis.

Thus, some measure of control over behavior can be exercised "by arranging environmental inducements, generating cognitive supports, and producing consequences" (Bandura, 1977, p. 13). Behavior can be created and changed on an individual level as an individual observes and interprets the environment and its contingent occurrances and learns to predict and react appropriately (Bandura, 1977).

Bandura's Observational Learning Theory

Because of the complexity of studying social learning with all its many variables, Bandura systematically focuses on limited phenomena directly within complex settings (McLaughlin, 1971). In doing so, Bandura (1971) formulates that modeling phenomena are governed by four interrelated subprocesses, each of which has its own controlling variables. The four subprocesses are attention, retention, motor reproduction, and motivation (see Figure 4).

Bandura's observational learning theory, which is a more analytical approach to his social learning theory, has two assumptions. First, the observer is capable of attending to, retaining, comprehending and accepting the model's actions as appropriate from her or him to repeat under at least some circumstances (Flanders, 1968). Second, although models differ in their ability to exemplify the modeled behavior while observers vary in the degree to which they perform the modeled behavior, the observer can and does perform the modeled behavior accordingly (Bandura, 1977).

Attention Processes

Attention processes are the first subprocess in Bandura's observational learning theory. The primary variables of the modeling stimuli are distinctiveness,

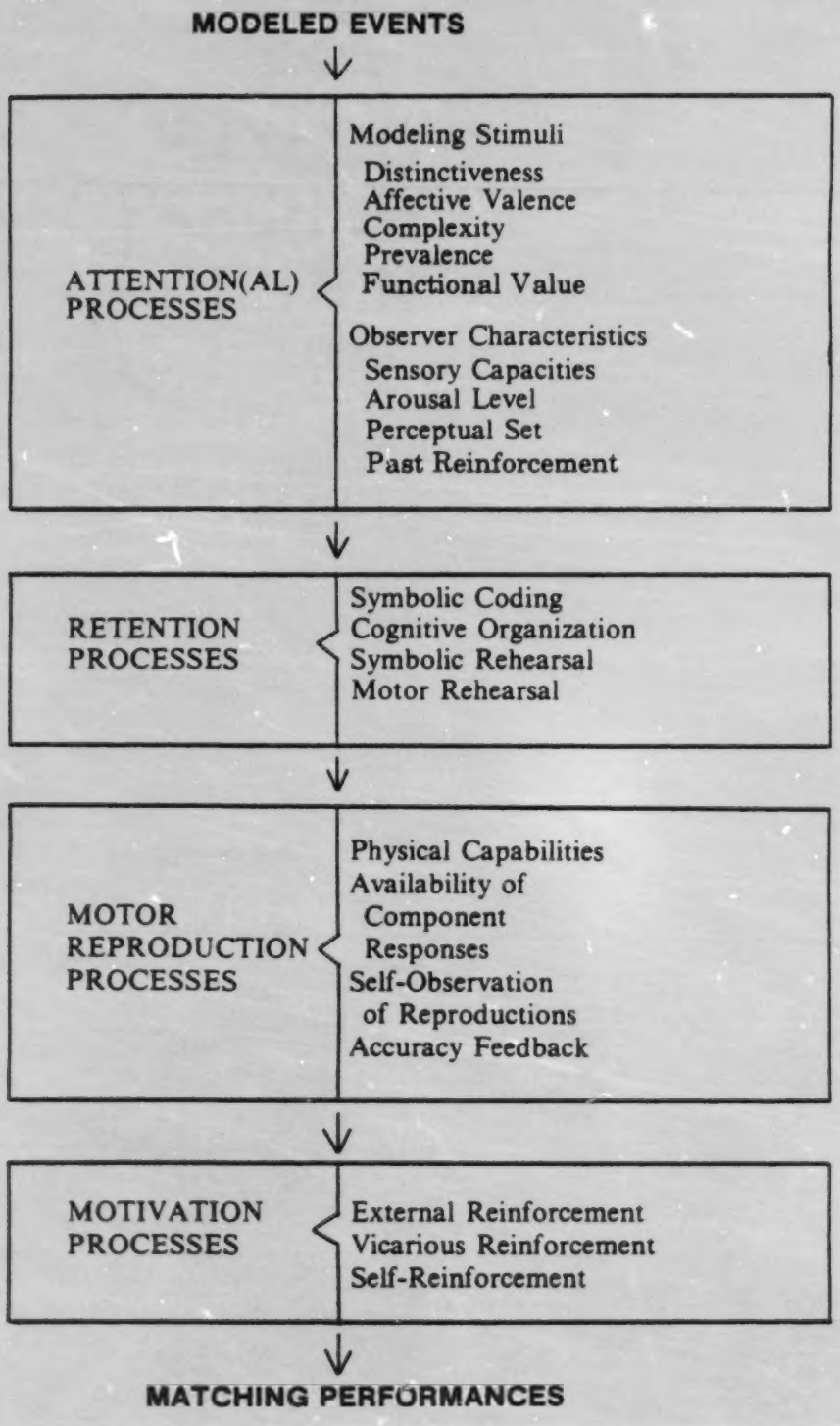

Figure 4. Component processes governing observational learning in the social learning analysis (Bandura, 1977, p. 23).

affective valence, complexity, prevalance, and functional value, while, the primary variables of the observer's characteristics are sensory capacities, arousal level, perceptual set, and past reinforcement (Bandura, 1977). Other possible variables include frequency, duration, rate, saliency, and complexity of visual cues (McLaughlin, 1971). It is through discrimination that attention processes regulate sensory input and perception of modeled actions (Bandura, 1974). Because the observer must attend to recognize and differentiate between the distinctive features of the model's responses, discriminative observation is one of the requisite conditions for observational learning (Bandura, 1971). As such, as McLaughlin (1971) writes, a child "chooses selectively from the models he [or she] encounters and even from behavior of individual models" (p. 153). First, the model's physical and acquired distinctiveness as well as the model's power and interpersonal attractiveness influence whether or not the modeled behavior will be performed. Research done by Bandura and others indicates that a model who controls resources, is older, more skillful, and/or higher in social status is more readily imitated.

Second, due to the complexity of stimuli, the observer's incentives and the observer's motivational and psychological characteristics all play a role in whether or not mere exposure to a model is enough for the observer

to perform the modeled behavior. Thus, the observer may or may not choose to adapt relevant cues and/or to perceive the stimuli accurately. Also, the aims and priorities as well as the,

> Motivational conditions, prior training in discriminative observation, and the presence of incentive-oriented sets may strongly determine those features of the environment and those models to which a person attends. (McLaughlin, 1971, pp. 137-138)

And third, people who are most frequently associated with, by choice or not, are those who are observed most often, and in turn more likely to be modeled after. Along with this, Bandura (1977) states that,

> As a result of correlated experiences over time, events that were formerly neutral gain productive value. After people discern the relationships between situations, actions, and outcomes, they can regulate their behavior on the basis of such predictive antecedent events. (p. 58)

In essence, based on past experience and the situation at hand, the observer's perception plays a key role in what features will be extracted from a given observation and how modeled behavior will be interpreted and performed.

Retention Processes

Retention processes are the second subprocess in Bandura's observational learning theory. The primary variables are symbolic coding, cognitive organization, symbolic rehearsal, and motor rehearsal. It is through these and other variables that retention processes cognitively guide the transitory experiences from observations and memory representations to enduring performance guides (Bandura, 1974 and 1977). The main representational systems of symbolism are visual and verbal. Through the use of symbolism, an observer functions as an active agent as modeling stimuli produce highly correlated though not exact, sensory conditions of persons, activities, places, and things that are retrievable from memory through cognition (Bandura, 1971). As McLaughlin (1971) states, "In order to reproduce social behavior without the continued presence of external modeling cues, a person must be able to retain the original observational input in some symbolic form" (p. 138). According to Bandura (1977) young children primarily interpret or classify memories selectively through visualization and imagery as they learn through observation. And, since young children mostly observe rather than code modeled activities into verbal codes such as words, concise labels, or vivid imagery, they learn and retain behavior at a much slower rate. The other memory aid, rehearsal, can be expressed overtly or covertly.

Young children mostly imitate directly and immediately, or overtly, because due to the model's external guidance of the child's actions, overt behavior does not require much cognitive functioning. As the child matures, she or he achieves the highest level of observational learning and is able to first organize and rehearse modeled behavior symbolically, or covertly, prior to enacting it overtly. As in symbolism, the observer functions as an active agent through cognition prior to overtly performing a modeled act.

Motor Reproduction Processes

Motor reproduction processes are the third subprocess in Bandura's observational learning theory. The primary variables are physical capabilities, availability of component responses, self observation of reproductions, and accuracy feedback. Through the process of motor reproduction, symbolic representations are converted spacially and temporally into appropriate action in accordance with the modeled behavior. This is enhanced on the basis of informative feedback through the four mechanisms of performance referred to as cognitive organization of responses, their initiation, monitoring, and refinement (Bandura, 1977). The rate and level of observational learning needed to successfully covertly replicate the modeled behavior is dependent on the cognitive and physical abilities and skills of the

observer. Practice as well as learning in stepwise fashion may be necessary for acquiring more complex response patterns and behaviors (Bandura, 1971).

Motivation Processes

Motivation processes are the fourth subprocess in Bandura's observational learning theory. The primary variable, reinforcement, is of three types--external reinforcement, vicarious reinforcement, and self-reinforcement. Because an observer is more likely to value, and therefore to adopt, modeled behavior that is positively reinforced, Bandura (1971 and 1977) makes a distinction between acquisition of imitative responses and their performance. Reinforcement regulates the overt replication of behavior and behavioral change through acquisition and performance by aiding the observer in attending to and selecting behavior to replicate, and in turn, to perform the modeled behavior through the modes of symbolism and rehearsal. Due to the fact that there are so many additional variables in observational learning, simply having models of prominent characteristics does not guarantee that their behavior will be replicated. However, modeled behavior and behavioral change will usually be replicated if the model uses techniques such as repeating instructions to the observer, instructing other observers, giving physical prompting whenever the observer fails, and rewarding successes. Therefore, external,

vicarious, and self-reinforcement are the three ways reinforcement may be operating to determine whether or not observationally acquired responses will be performed through motivational processes (Bandura, 1977).

Rosenthal (1979) states that there are three key conclusions in social learning theory as it relates to conceptual behavior. All three also apply to Bandura's observational learning theory. First, there are an enormous number of alternatives available to draw information from; second, when compared to repetitive, overt rehearsal, modeling is usually a more efficient way of acquiring abstract or complex human activities in which symbolic comprehension is essential; and third, demonstrations, rather than verbalizations, provide a much more beneficial means of guiding young children.

Bandura vs Skinner

Now, to briefly compare the viewpoints of Bandura and Skinner concerning the reciprocating factors which determine overt behavior. In Skinner's operant conditioning, modeling phenomena are governed by specific stimulus-response associations. In social learning theory it is thought that modeling is influenced primarily through a balance of the reciprocating factors--the external environment, perception, and behavior--through their respective counterparts which are the processes of

reinforcement, symbolism, and self-regulation. First, according to Skinner's stimulus-response paradigm, reinforcement is directly administered. In contrast, as a contiguity theorist, Bandura thinks in terms of no direct reinforcement. Also, Skinner stresses positive reinforcement saying that although it may take longer to establish results, positive reinforcement is at least as effective as negative reinforcement.

Second, because Skinner endorses the methodology used in the biological and physical sciences, his research does not recognize symbolism as an important process: Skinner only studies overt behavior as seen in stimulus-response relationships. In contrast, Bandura thinks that symbolism, along with the process of reinforcement and self-regulation, plays an important role in behavior and behavioral change within the principle of reciprocal determinism.

Third, Skinner rejects the principle of self-regulation by primarily endorsing the concept of consequent determinants. He states that behavior is conditioned due to immediate responses, and over time, responses of past behavior cause a person to respond the same way on future occasions. In contrast, Bandura thinks that a person responds to a stimulus perceptionally, through acquisition, by keeping this information symbolically in mind. Then, the process of self-regulation guides the behavior, or performance, according to antecedent determinants through

anticipation of the outcome.

Along with this, Skinner states that the type and degree of freedom individuals have is driven by the external environment through a balance of control and counter control. In contrast, Bandura thinks that the freedom of individuals is controlled by the principle of reciprocal determinism through a balance of interrelationships of perception, behavior, and the external environment. Thus, both Skinner and Bandura agree that the individual does not have total control, nor is behavior totally without control. Skinner says man can control behavior by re-designing the environment while Bandura says that through the processes of reinforcement, symbolism, and self-regulation individuals can have some control over their behavior.

Bandura's Research as Applied to this Thesis

Although a full description of the experiment is in the chapter on methodology and procedure (Chapter 4), some basic points are discussed here. To relate the information just presented to the topic of this thesis, the model in the experiment incorporated all four subprocesses with the interacting factors of reciprocal determinism. For example, attention, retention, motor reproduction, and motivation processes were all enacted through the reinforcer of reward. More specifically, affective

valence, symbolic coding, cognitive organization, motor rehearsal, self-observation of reproductions, and vicarious reinforcement may have all been operating in the high experimental setting. The subprocess of attention may have been operating through the reinforcer of high affect. Here, the model's affective valence was demonstrated by the way of smiles, nods, and winks to the subject. Also, attention subprocesses may have been operating through the reinforcers of proximity and high nurturance through the model's attire, status, and friendliness. In summary, reinforcement may have been operating indirectly through specific social modeling techniques.

METHODOLOGY AND PROCEDURE

Subjects and Experimenter

One hundred sixteen subjects were matched by sex and age then randomly assigned to the high experimental, the low experimental, or the control settings. This method allowed for approximately equal numbers of each ethnic group to appear in each condition. Ten subjects had to be dropped from the study. Each was randomly replaced by a subject matched in sex and age. The age range of all the subjects was 37 to 64 months and the mean age was 53 months. The mean age of older subjects was 59 months. The mean age of younger subjects was 47 months. A 3 X 2 X 2 factorial design consisting of four groups of subjects--older boys, younger boys, older girls, and younger girls--within three experimental settings was established to study the influence of social modeling, sex, and age.

The experimenter, a female, was the model. The term model is used only when she was actually performing the role of the model, as the experiment was in progress. The word experimenter is used to refer to her at all remaining times. However, she did introduce herself to each subject as a visiting preschool teacher.

Setting and Procedure, in General

Del Paso Early Childhood Development Center in Sacramento, California was the site for the experiment. There were ten morning preschool classes for three to five year old children. The classrooms were located in three buildings. The experimental room was a five-sided room, approximately 1.20 X 3 X 2.60 X 3.40 X 4.30 meters, which is used as an office in the child development center.

A desk, a file, a bookcase, and a table for office purposes needed to remain in the room at all times. Since the experimental room was small and had furniture which needed to remain in it, the two preschool height tables used for the experiment were arranged in an "L" shape with two child size chairs on the longest side and the third child size chair facing one of them at the foot of the "L." The experimental room and the furniture arrangement was the same for both of the experimental settings and for the control setting (see Figure 5).

Initially, all three toys were attractively displayed on the tables, "ready to use." All the items were neatly arranged so that the playing surface for each toy was empty while the items were within easy reach. Prior to allowing each subject use the felt shape toy, the flannel board was placed on the table with the handle (or top) towards the center of the table. Because of the large size of the flannel board, the felt shapes were initially placed on a wooden tray (25.40cm X 45.72cm) in the center of the flannel

board for the subject to move where desired. This was to make allowances for use of the preferred hand, without forcing a subject to use the left or the right hand while manipulating this toy. Prior to allowing each subject use the colored block toy, the tray was placed so the top was about 28cm from the edge of the table where the subject sat. Above, and towards the center of the table, the colored blocks were placed in a medium size bowl. Prior to allowing each subject use the golf tee toy, the raised pegboard was placed on top of the tray so the top was about 28cm from the edge of the table where the subject sat. Above, and towards the center of the table, the golf tees were placed in a small bowl.

The experiment was conducted only in the mornings from 9 to 11:30 a.m., Monday through Friday, during the months of April and May. On the days the experiment was conducted, about five to 10 subjects were taken individually by the experimenter to a small room in the main office building. All the subjects were familiar with the room which was located between the school administrator's office and the secretary's office, just across the hall from the school nurse's office. The control subjects, followed by the low experimental subjects, participated first. Then, the high experimental subjects participated.

In order to allow for as "natural" of a preschool setting as possible, only rules which were consistent with the school's policy were established. The rules were

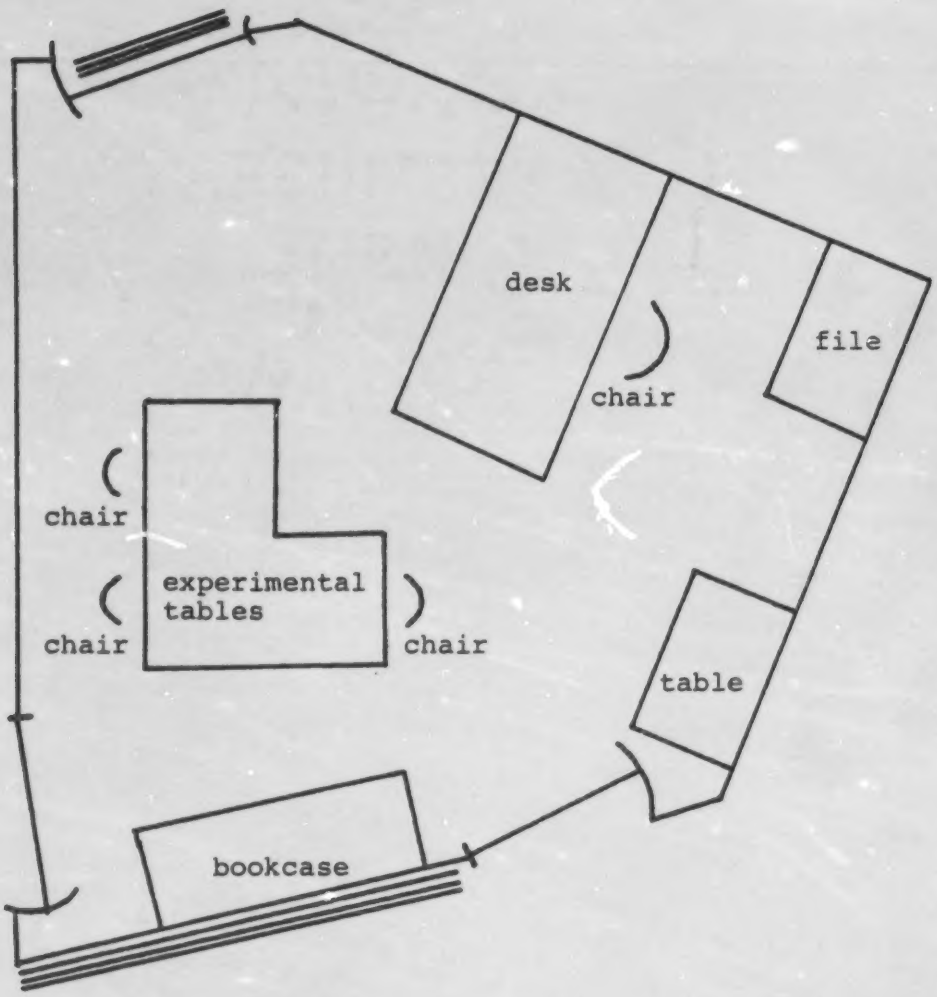

Figure 5. Room arrangement used for both of the experimental settings and the control setting. The scale is 1.91cm equals 30.48cm.

consistently enforced for all the subjects in both of the experimental settings and in the control setting. There were three primary rules. First, the subject may not harm

himself or herself, the environment, or others. Second, if a subject chooses to play with a toy in the experimental room but not at the table, the model would refrain from being too strict in order to allow some freedom and creative toy usage, just as is done within limits in a classroom setting. And, third, if a subject chooses to play with his or her first and second choice toys at the same time, it was decided in advance that this would be permissible. This latter situation was acceptable because actual manipulation and playing with the critical toy was the pre-determined reason for ending the experiment prior to the five minute time limit. Two subjects played with their first and second choice toy simultaneously.

When the experimenter and the subject were in the room, the experimenter said she had some toys to show the subject. She briefly demonstrated how each toy could be used. The method of paired comparisons was used to determine the subject's rank-order of toy preference. Each time, a toy was removed from the table so the subject only saw the toys she or he currently was to rank-order. The third choice toy was subsequently referred to as the critical toy for that particular subject, though not stated as such to the subject. If a subject did not rank-order all three toys, the method of paired comparisons was repeated one time. When the subject's rank-order of toy preferences was determined, the experimenter said, "I am going to put this toy here (as she placed the subject's first choice toy in front of the

subject). This toy here (as she placed the subject's second choice toy in its appropriate position) and this toy here (as she placed the subject's third choice toy in its appropriate position). You can play with any toy you choose and you may change to a different toy if you want." The experimenter waited until the subject actually touched the first choice toy prior to starting the experiment. After the subject's choice was confirmed, the experimenter set a timer for five minutes and placed it in a soundproof box. At the beginning of the five minute experimental time, the model said, "You may play with any toy you choose." After a couple of minutes, the model stopped playing with the critical toy, stood up, and walked away from the toys. As she did, she asked if the subject wanted to continue playing with the currently preferred toy, or, if the subject wanted to play with one of the other toys. Upon the subject's reconfirmation of toy selection, the model said, "I am going to play with this toy" and sat down, resuming play with the critical toy. There were no other deliberate actions or verbalizations to encourage or discourage the subject to change toys. The model played with the critical toy as she manipulated the items and talked about the critical toy. For the actual experiment, all four reinforcers--affect, reward, proximity/distance, and nurturance--were assumed to be operating jointly as the model attempted to change preschool children's toy preferences (see Table 1). The actual experiment lasted five minutes for those subjects who

had not changed to the critical toy or less than five minutes for those who did. At the end of the experiment, the experimenter told the subject that it was almost time to return to the classroom. The subject was allowed to play with any of the three toys for a minute or two longer, prior to helping the experimenter put the toys away in their initial manner and places. The experimenter then told the subject she enjoyed spending time with the subject, and she walked the subject back to the classroom.

The High Experimental Setting

Procedure for the High Experimental Setting

When the experimenter went to a classroom to get a high experimental subject she was neutral in character. However, once she and the subject were out of the sight and listening range of others, she was active and receptive towards the subject as she casually chatted and smiled, showing positive affect and nurturance. As they walked slowly to the experimental room, the experimenter spent a couple of minutes asking questions about such general topics as animals and pets at home and at school, things the subject like to do and eat, places the subject liked to visit, and so forth. General conversation was maintained until the actual experiment. At this time, only the content of the conversation was changed as the model directed her conversation to the topic of the critical toy, rather than

the subject. During the experiment the conversation only shifted back to the subject to briefly answer a specific question the subject asked. Following the experiment, high affect and high nurturance were continued as the experimenter's conversation shifted back to the subject in the original manner.

Reinforcers that may have been Operating in the High Experimental Setting

This author chose to study four reinforcers in the high experimental setting--high affect, high reward, proximity, and high nurturance. Each is isolated here only to define and to understand what qualities each reinforcer encompassed. However, during the experiment they were studied jointly. In the high experimental setting, the model made statements about the reinforcers of high affect and high reward by stating personal likes and preferences of the critical toy in conjunction with the psychological factors of novelty, curiosity, and attention. Although it is difficult to distinguish between novelty, curiosity, and attention an attempt is made. Novelty refers to the model's noting the newness of a toy, curiosity refers to the distinguishing qualities of a toy of interest to the model, and attention refers to the model's awareness of a toy.

The first reinforcer, high affect, may have been operating through vicarious positive reinforcement. It consisted of the model's expressiveness in body actions by

exhibiting animated body gestures and facial expressions through smiling, winking, and wide-eyes. These expressions overtly displayed enjoyment and pleasure gained from playing with the critical toy. At the same time, the model made enthusiastic comments about the critical toy by stating her likes and preferences when mentioning aspects such as novelty, curiosity, and attention. An example of a comment expressing novelty is, "This toy is different, I haven't seen it on television. I would like to play with it." An example of a statement expressing curiosity is, "I like toys with lots of color." Examples of statements expressing attention are, "The blocks are fun because they are noisy," and, "I like hard (or soft) toys."

The second reinforcer, high reward, may have been operating through vicarious positive reinforcement. It consisted of the model's expressiveness in body actions and verbalizations when drawing aesthetic, mathematical, cognitive, and/or creative comparisons of the items within the critical toy and when actually manipulating the items in these and other ways. Within the reinforcer of high reward, the term mathematical refers to the model's manipulation of the items within a toy by counting, making geometric designs, dealing with fractions, making equations, and so forth. As in the high affect situation, the model mentioned aspects such as novelty, curiosity, and attention. An example of novelty is, "The golf tees look like a fun toy, I think I will count how many there are." Two examples of

curiosity are, "I hope there are enough squares to fit in one long row across the flannel board. That would make me happy." And, "I made two triangles into one square!" Examples of attention are, "I can match all the red shapes," and "I made one tall stack (or row)."

The third reinforcer, proximity, may have potentially allowed for friendly interactions between the model and the subject. The model's nearness to the subject was to encourage the subject to change to playing with the critical toy: the subject could readily approach the critical toy due to its closeness and easy access (see Figure 6).

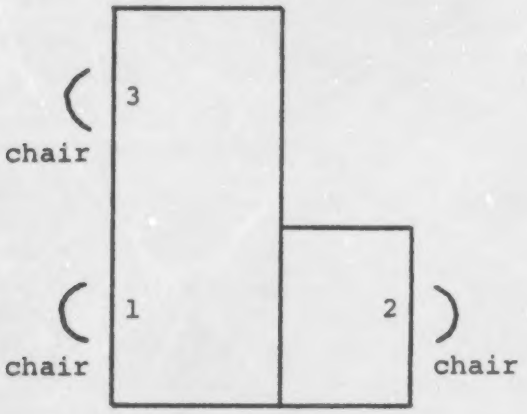

Figure 6. Toy placement for the high experimental setting. The first choice toy is denoted by 1, the second choice toy is denoted by 2, and the third choice toy is denoted by 3.

The fourth reinforcer, high nurturance, may have been operating through vicarious positive reinforcement. It consisted of the model's expressiveness in body actions by exhibiting qualities such as warmth, friendliness, and emotional support. The model interacted with the subject in a spontaneous and respectful manner. The model's thoughts and feelings were displayed orally as described in the reinforcers of high affect and high reward. The model was active and receptive as she played with the critical toy.

The Low Experimental Setting

Procedure for the Low Experimental Setting

The model was quiet and reserved while performing the identical sequence of activities as in the high experimental setting. When the experimenter went to a classroom to get a subject, she was calm and relaxed though expressionless. This calm and quiet behavior was maintained throughout the experiment. She displayed low affect and low nurturance at all times--towards the subject as they walked to and from the experimental room and towards the critical toy during the actual experiment. During the experiment no extreme likes, dislikes, or boredom of the critical toy were displayed by the model's body actions or verbalizations. The only questions and comments the model made were ones necessary to carry out the experiment. A small portion of possible comments such as the ones listed under the reinforcers of low

affect and low reward were stated by the model. Whenever a subject talked or asked questions, the model responded briefly. By not reinforcing the subject or herself, the model, low reinforcement was operating in the low experimental setting.

Reinforcers that may have been Operating in the Low Experimental Setting

In the low experimental setting, the model's presence was the reinforcer that was operating. Each of the four reinforcers within social modeling--low affect, low reward, distance, and low nurturance were all assumed to be operating at a low, or neutral level. Each is isolated here only to define and to understand what qualities each encompassed. However, during the experiment they were jointly studied. The model made neutral statements about the reinforcers of low affect and low reward by not stating personal likes and preferences of the toys in conjunction with the psychological factors of novelty, curiosity, and attention.

The first reinforcer, low affect, consisted of neutral expressions of the physical qualities of the critical toy. The model dealt with the subject by being as expressionless as possible and using no animated gestures, no smiles, and no winks while keeping her eyes normal in size at all times. The model was neither offending nor threatening to the subject. The model's verbalizations were kept to a minimum by talking less often than in the high experimental setting.

The model mentioned aspects such as novelty, curiosity, and attention in a neutral manner. An example of novelty is, "This toy is different, I have not seen one like it on television." An example of curiosity is, "This toy has lots of colored pieces." Examples of attention are, "The blocks are a noisy toy," and "This toy has pieces that are hard (or soft)."

The second reinforcer, low reward, consisted of neutrality of body actions and verbalizations when drawing aesthetic, mathematical, cognitive, and creative comparisons of the items within the critical toy and when actually manipulating the items in these and other ways. As in the low affect situation, the model mentioned aspects such as novelty, curiosity, and attention in a neutral manner. An example of novelty is, "This toy seems to have a lot of blue golf tees." An example of curiosity is, "I wonder, if I line up the squares in one long row if they will all fit on the flannel board." Examples of attention are, "There are lots of red shapes that match," and, "These pieces can be stacked or made into rows."

The third reinforcer was distance. Here, the tables were a deliberate barrier to discourage the subject from changing to the critical toy. Distance lessened the likelihood of relating as friends, and instead, caused a relationship more cognizant of strangers who were both physically present but alienated by distance. The model's distance from the subject was to discourage the subject

from walking all the way around the tables to play with the critical toy (see Figure 7).

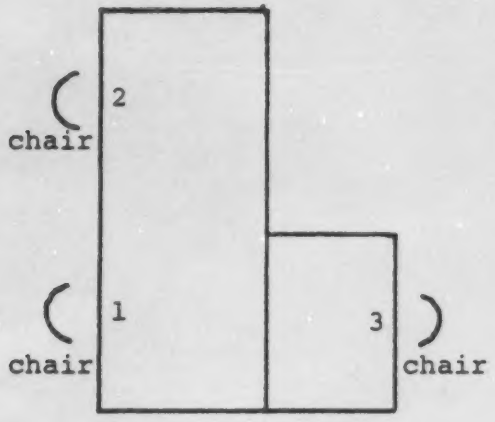

Figure 7. Toy placement for the low experimental and the control settings. The first choice toy is denoted by 1, the second choice toy is denoted by 2, and the third choice toy is denoted by 3.

The fourth reinforcer, low nurturance, consisted of neutral expressions of body actions by exhibiting the indifference or a lack of warmth, friendliness, and emotional support of a stranger to the subject while playing with the critical toy. The model's body actions and verbalizations were kept to a minimum and were as neutral as possible. The model was quiet and reserved while she played with the critical toy.

The Control Setting

Procedure for the Control Setting

In the control setting the experimenter was as neutral as possible. She performed the identical sequence of activities as in the low experimental setting until the five minute experimental time when she told the subject she had to leave the room for a few minutes but would be right outside the door. She stepped outside, closed the door, and observed the subject through a narrow opening in the window of the door for the duration of the experiment. In this, the no model control setting, no reinforcement was operating due to the model's absence from the room during the actual experiment.

DATA ANALYSIS AND RESULTS

Introduction

The three hypotheses of this study were concerned with the influence of social modeling on changing preschool children's toy preferences. To examine the hypotheses, varying degrees of reinforcement were operating in a high experimental setting, a low experimental setting, and a control setting. The purpose of this chapter is to present the analysis of all three hypotheses of the study.

The Hypotheses

Statistical Statements of the Hypotheses

Specifically, the hypotheses tested are as follows:

1. The proportion of change due to the social modeling reinforcers assumed to be operating is expected to be in a descending order of probability from high to medium to low when comparing a high experimental, a low experimental, and a control setting. The specific form of the relationship which best explains the results is the following:

$H_o: \pi_h = \pi_l = \pi_c$

$H_a: \pi_h > \pi_l > \pi_c.$

Where π_h, π_l, and π_c denote the proportion of children who changed preference from their first choice toy to the

critical toy in the high experimental, low experimental, and control groups respectively.

2. The proportion of change in girls' preferences from their first choice toy to the critical toy is higher than the proportion of change in boys' preferences. The specific form of the relationship which best explains the results is the following:

$H_o: \pi_g \leq \pi_b$
$H_a: \pi_g > \pi_b$.

Where π_g denotes the proportion of girls who changed preference and π_b is the proportion of boys who changed from their first choice toy to the critical toy.

3. The proportion of change in younger children's preferences is higher than the proportion of change in older children's preferences. The specific form of the relationship which best explains the results is the following:

$H_o: \pi_y \leq \pi_{old}$
$H_a: \pi_y > \pi_{old}$.

Where π_y denotes the proportion of younger children who changed preference and π_{old} is the proportion of older children who changed from their first choice toy to the critical toy.

These three hypotheses were tested using the chi-square test. A transformation was also used to normalize the distribution for the purpose of using the analysis of variance. The latter technique tests a set of three hypotheses corresponding to the ones previously mentioned

except that they are expressed in terms of means.

Results, in General

To determine if social modeling influenced changing the toy preferences of preschool children a 3 X 2 X 2 factorial design was used. The children were matched on sex and age and assigned to the experimental groups randomly. In order to show that the matching was effective, the mean ages of children and the proportion of males in the sample in the high experimental setting, the low experimental setting, and the control setting are shown in Table 2.

The raw data is presented in Table 3. The numbers in each of the cells are as follows: x equals the number of children who changed toy preference, n equals the total number of children who participated, p equals the proportion of change, and p' equals the transformation of the proportion. The arc sin transformation for proportions was chosen because it improves the normality of the distribution and stabilizes the variance (Mosteller & Youtz, 1961). The mathematical formula is given by Freeman and Turkey (1950, p. 607). The equation is as follows:

$$p' = \sin^{-1}\sqrt{\frac{x}{n+1}} + \sin^{-1}\sqrt{\frac{x+1}{n+1}}.$$

Table 4 shows the analysis of variance of the transformed proportions.

Table 2

Mean Ages of the Children in Each Setting and the Proportion of Males in the Sample

	High Experimental Setting	Low Experimental Setting	Control Setting
Mean Age	53 Months	53 Months	53 Months
Proportion of Males	.46	.51	.50

Table 3

Proportion of Change to the Critical Toy by Sex and Age

	High Experimental Setting		Low Experimental Setting		Control Setting	
	Male	Female	Male	Female	Male	Female
Older	x = 4 n = 9 p = .444 p′ = 42·12	x = 6 n = 11 p = .545 p′ = 47·40	x = 2 n = 11 p = .182 p′ = 27·05	x = 3 n = 10 p = .300 p′ = 34·28	x = 2 n = 9 p = .222 p′ = 29·89	x = 2 n = 9 p = .222 p′ = 29·89
	Male	Female	Male	Female	Male	Female
Younger	x = 5 n = 9 p = .555 p′ = 47·88	x = 6 n = 10 p = .600 p′ = 50·26	x = 1 n = 10 p = .100 p′ = 21·39	x = 1 n = 10 p = .100 p′ = 21·39	x = 0 n = 9 p = 0.000 p′ = 9·22	x = 0 n = 9 p = 0.000 p′ = 9·22

Table 4

Analysis of Variance of the Transformed Proportions

Due to	SS	df	MS	F	Sig.
Treatment	1635.67	2	817.83	14.04	$p < .01$
Age	219.05	1	219.05	4.76	N.S.
Sex	18.50	1	18.50	.28	N.S.
Residuals	337.21	7	48.17		
	2210.43	11			

Hypothesis 1

Analysis and Findings of Hypothesis 1

Raw data from Table 3 is compiled in Table 5 to illustrate the variable of treatment as it relates to Hypothesis 1. Table 3 indicates that 21 of the 39 subjects in the high experimental and seven of the 41 subjects in the low experimental and four of the 36 subjects in the control setting changed to the critical toy. These are equivilent to 54%, 17%, and 11%, respectively.

Table 4 is a three way analysis of variance. It is assumed that all interactions are not significant. The variable of treatment was significant at the .01 level. Therefore, the null hypothesis was rejected. Since age and sex were not significant, the analysis of variance of transformed proportions was performed assuming a simpler model which contains only the influence of treatment. The new table for analysis of variance is Table 6 which shows again that the effect of the treatment is significant.

The Scheffe' method of multiple comparisons was conducted and the results are shown in Table 7. The symbols and numbers in each of the columns designate the contrasts of each comparison. In the first column, Ψ is the population contrast. The μ's represent the population means. In the second column, $\hat{\Psi}$ equals the estimate of the contrast. In the third column, $\sigma_{\hat{\Psi}}$ equals the positive square root of the estimate of variance. In the fourth column, the ratio of

Table 5

Proportion of Change to the Critical Toy

High Experimental Setting	Low Experimental Setting	Control Setting
x = 21	x = 7	x = 4
n = 39	n = 41	n = 36
p = .536	p = .171	p = .111
p′ = 46•92	p′ = 26•03	p′ = 19•56

Table 6

Analysis of Variance Using the Reduced Modeling

Due to	SS	df	MS	F	Sig.
Treatment	1635.67	2	817.83	12.81	$p<.01$
Residuals	574.76	9	63.86		

Table 7

Scheffe' Test Contrast

ψ	$\hat{\psi}$	$\sigma_{\hat{\psi}}$	$\hat{\psi} / \sigma_{\hat{\psi}}$	Sig.
A. $\mu_1 - \mu_2$	20.886	1.787	11.689	Sig.
B. $\mu_1 - \mu_3$	27.360	1.847	14.813	Sig.
C. $\mu_2 - \mu_3$	6.473	1.825	3.457	Sig.
D. $\frac{\mu_1 - \mu_2}{2} - \mu_3$	9.111	1.604	5.680	Sig.

Note. ψ **equals psi,** σ **equals sigma, and** μ **equals mu.**

the estimate of contrast is compared with the positive square root of the estimate of variance, $\hat{\psi} / \hat{\sigma}_{\hat{\psi}}$. And, in the fifth column, Sig. indicates significance at the .05 level. Thus all four ratios are significant. The most significant contrast was shown in Row B when the high experimental and the control settings were compared. Here, the significant influence of social modeling was evident when comparing the treatments of vicarious positive reinforcement and no reinforcement.

The chi-square test of homogeneity is illustrated in Table 8. The value of χ^2 is 20.621 with two degrees of freedom, this is significant at the .05 level with a critical value of 5.991. Therefore, the null hypothesis is rejected by both the chi-square test as well as the analysis of variance test.

Hypothesis 2

Analysis and Findings of Hypothesis 2

The analysis of variance test done on the variable of sex which is illustrated in Table 4 shows that the results are not significant. The chi-square test of homogeneity is illustrated in Table 9. These results are also not significant, χ^2 is .598 and for one degree of freedom at the .05 level the critical value is 3.841. Therefore, Hypothesis 2 is not supported by either the analysis of variance test or by the chi-square test. In conclusion, the

Table 8

Chi-square Test of Homogeneity

	High Experimental Setting	Low Experimental Setting	Control Setting	Totals
Changed	21	7	4	32
Did Not Change	18	34	32	84
Totals	39	41	36	116

Table 9

Chi-square Test of Homogeneity on the Variable of Sex

	Male	Female	Totals
Changed	12	16	28
Did Not Change	27	25	52
Totals	39	41	80

Note. This table includes only the two experimental settings as illustrated in Table 3.

variable of sex did not have a significant influence in changing the toy preferences of preschool children.

Hypothesis 3

Analysis and Findings of Hypothesis 3

Table 3 indicates that 19 of the 59 older children in the experiment changed to the critical toy. This is equivilent to a proportion of 32%. In comparison, 13 of the 57 younger children in the experiment changed to the critical toy. This is equivilent to a proportion of 23%.

The chi-square test of homogeneity is illustrated in Table 10. These results are not significant, the value of χ^2 is .093 and for one degree of freedom at the .05 level the critical value is 3.841. Therefore, Hypothesis 3 is not supported by either the analysis of variance test or by the chi-square test. In conclusion, the variable of age did not have a significant influence in changing the toy preferences of preschool children.

Table 10

Chi-square Test of Homogeneity on the Variable of Age

	Younger	Older	Totals
Changed	13	15	28
Did Not Change	26	26	52
Totals	39	41	80

Note. This table includes only the two experimental settings as illustrated in Table 3.

CONCLUSION

Statement of the Findings

Hypothesis 1, states that the proportion of change due to the social modeling reinforcers assumed to be operating is expected to be in a descending order of probability from high to medium to low when comparing a high experimental, a low experimental, and a control setting. The results of this study substantially support Hypothesis 1.

Hypothesis 2, states that the proportion of change in girls' preferences from their first choice toy to the critical toy is higher than the proportion of change in boys' preferences. The results of this study do not support Hypothesis 2.

Hypothesis 3, states that the proportion of change in younger children's preferences is higher than the proportion of change in older children's preferences. The results of this study do not support Hypothesis 3.

Discussion

As stated by Bandura (1969), "Experiments are. . . needed that test the magnitude of vicarious reinforcement

effects as a function of comparability of social sanctions customarily applied to models and to observers" (p. 30). Through the use of modeling, by encouraging a child to change from one stimulus to another, a model can probably change a child's preference. This author has accepted this challenge by attempting to follow through on the works of Zimmerman, Koussa, and Bandura.

Of the relatively small amount of research that has been done on changing preschool children's toy preferences, virtually all of it, that this author was able to locate, has been administered using negative reinforcement. Research pursued in this manner can be depressing and frustrating both to young children and to adults. First, taking a preferred toy or object away or forbidding a young child to play with an available toy he or she likes through the use of verbal threats, of varying degrees, may seem cruel because the child may experience a sense of loss in a material thing as well as a lessening of self worth. Such actions and words seem insensitive to the feelings of young children, even though other toys may still be available. Second, deliberately confronting a young child seems unethical: adults should refrain from causing frustration and stress in young children unless this is absolutely necessary.

On the other hand, there are times when adults do need to change children's preferences. Thus, because the theoretical implications of guiding a young child from one preferred object, activity, or behavior to another can be

necessary, such research is important. But, how can this be done within the realm and goals set by early childhood educators and experts? The lack of research using positive methods of changing children's preferences is why this author chose to study the concept of changing preschool children's toy preferences by exploring and applying Bandura's observational learning theory. More specifically, this author studied the influence of social modeling techniques such as affect, reward, proximity/distance, and nurturance through vicarious positive reinforcement. In conclusion, as Hypothesis 1 clearly illustrates vicarious reinforcement is the most effective treatment.

The remainder of this section on discussion is an attempt to integrate the findings of the present study with the findings of some of the related research which was cited in the introductory chapter (Chapter 1). To begin with, a number of studies show that social modeling is one generally successful method of changing children's preferences (Masters, Anderson, & Fitzpatrick, 1975; Morris, Sharkey & Redd, 1979; Zimmerman, 1976; and Zimmerman & Koussa, 1979).

The research for this thesis is basically a replication of the works done by Zimmerman (1976) and Zimmerman and Koussa (1979). Five settings were administered in each of the works that are replicated. Their results as well as the results of this research are all very similar. All three studies support Bandura's theory of observational learning, that cognition plays a role in changing the toy preferences

of preschool children. The results of Hypothesis 1 of this study show a general tendency for young children to change their toy preferences due to adult social modeling. This was evidenced even though the subject could continue playing with her or his first choice toy.

The results of Hypothesis 2 of the present study were not considered significant. However, there was a slight tendency for girls to change their toy preferences more readily than boys. The results are inconsistent in theoretical position as well as findings of the study done by Zimmerman and Koussa (1979). To elaborate, Zimmerman and Koussa studied affect and rewardingness in different combinations than this author. Part of their results indicate that when low affect is combined with rewardingness, boys are more easily influenced than girls.

The results of Hypothesis 3, in regards to younger children changing their preferences more frequently than older children, are not significant. It is interesting to note, however, that the reversal of this was indicated as a tendency for a higher percentage of older children changed their toy preferences. No research comparing older to younger children's change in preferences was located by this author. Therefore, the results of this hypothesis cannot be compared with other related research.

Limitations

Limitations Based on the Criteria Set for Related Research

An attempt was made to apply three major delimitations to the related research that was actually cited, with regard to the sample each of the authors used. Concerning the first delimitation, whenever possible the age of the subjects was limited to preschoolers, meaning two to six years old. Of the articles, or parts of articles, cited three research articles used subjects over six years of age. First, in Experiment 2 of Turner and Wright's (1965) research only six to eight year olds participated as subjects. Second, of all the research articles commented on by Thelen and Rennie (Maher, 1972), the ones most directly related to this study concern nonalternate-trials studies. This is where the subject is exposed to the entire sequence of modeled behavior prior to having the opportunity to respond. Thelen and Rennie report that although such research is done on subjects over fourteen years of age, most is done on subjects under ten years of age. And third, in a research article by Sukemune, Haruki, and Kashiwagi (1977) older children as well as adults are subjects in the majority of articles they cite. However, eighteen of the fifty-eight articles they comment on do comply with this delimitation (see Appendix A).

Concerning the second delimitation, whenever possible research having a ratio of one adult model to one child as the subject was sought. This author edited comments in

Thelen and Rennie's (Maher, 1972) chapter and in Sukemune, Haruki, and Kashiwagi's (1977) article so only information that suits the criteria set for this delimitation is referred to in this study. Concerning the third delimitation, whenever possible only live model settings were cited. Again, the works by Thelen and Rennie and Sukemune, Haruki, and Kashiwagi are the only two that do not totally comply with this delimitation. This author edited their comments as explained earlier. The related research cited by Sukemune, Haruki, and Kashiwagi that appears to comply with the second and the third delimitations is illustrated in Appendix A.

At first, all three delimitations appear to restrict the application of the related research cited. However, the delimitations may, in fact, not be restrictive. For example, the results of many studies done on older subjects have been combined with the results of studies done on younger subjects (Maher, 1972; Rosenthal, 1979; and Sukemune, Haruki, & Kashiwagi, 1977). In addition, Bandura (1974) for one, has stated that what applies in a filmed model setting also applies in a live model setting. If this is possible, then, it could be that the reverse is also possible. Therefore, at least two of the three delimitations initially set for the related research may not, in reality, limit the application of their results. Their results and the results of this research may have farther reaching applications than initially meets the eye.

Methodology Limitations

Two possible limitations of this study are noted. First, the choice of toys may have been too restrictive for some subjects. Although this may have allowed for a more controlled setting, initial preference and change in preference may have been more, or less, significantly varied if a wide spread of toys, or toys with dissimilar qualities and usage, were used. As a result, this is considered a possible limitation of this study.

Second, for this study the only model was a female. The same-sex subjects may have responded differently if the model was a male. Therefore, this is considered a possible limitation, especially for Hypothesis 2.

Applications

In essence, just as Bandura's observational learning theory can be applied with toys as the medium, so too can his theory be applied in behavioral situations generally. Due to the theoretical base of this research, the applications are empirical. If children can be persuaded to change their toy preferences through high affect, high reward, proximity, and high nurturance, then children's preferences can be changed in other situations. This technique can aid parents and teachers in guiding and disciplining children: behavioral changes as well as educational lessons can be more readily learned by children

through positive techniques and environments. Also, although this research is not done in the framework of mental health, play therapy, and so forth, the findings may be applied in situations such as these. Research that uses a positive approach seems more applicable to all children especially those who are emotionally frustrated and/or disturbed. Vicarious positive reinforcement can be applied to change the preferences of preschool children in many settings and situations by helping the child learn:

1) to eat a wide(r) variety of foods through reinforcers such as novelty, curiosity, and attention;

2) how and when to talk on a one-to-one basis, as well as in a group setting;

3) proper and tactful ways to make and to keep friends;

4) to deal with others in long-term relationships, such as with family members;

5) to retain safety skills such as holding on to a rail when hiking or when riding an escalator, or, to buckle a safety belt in a vehicle;

6) new skills such as how to enjoy swimming and water sports as well as recreational activities associated with water;

7) to cope with a new or difficult or fearful situation or setting such as visiting a doctor, dentist, or hospital;

8) to increase the fun, humor, and enjoyment of life through the positive use of stories, books, travel, conversation, friendships, etc.;

9) that the end product is just as valid as the process by being able to first learn through the step of "process"--by experimenting and learning through the senses;

10) prerequisite skills to problem solving such as spontaneity and creativity;

11) to relax; and

12) to be oneself.

These are only a few of the many possible settings and situations that parents, teachers, and others have the opportunity to use various reinforcers within the technique of social modeling through vicarious positive reinforcement. The actual reinforcers may vary from setting to setting and from time to time but the principle is the same--to prevent unnecessary or undesirable problems in behavior and attitudes as well as fears of people, things, and ideas.

Recommendations for Further Study

Hypothesis 1 has been studied on only a few occasions. Since the results of Hypothesis 2 are inconsistent with the results of other studies, and, Hypothesis 3 may not yet have been studied in this manner, it is recommended that similar research be conducted in the future. Other approaches to

these questions could help to verify whether or not observational learning is indeed a way to change preschool children's preferences. In such research each reinforcer--affect, reward, proximity/distance, and nurturance--could be studied separately as well as in various combinations. The results of measuring such variables, separately as well as jointly, seem to have endless interacting implications and applications. Therefore, it is suggested that these and other related variables be studied and incorporated in future research on observational learning.

In addition, it would be interesting to note what proportion of subjects internalize specific reinforcers. If each reinforcer is measured separately, a method could be devised to measure the subject's amount of response in each degree it was operating. For example, it may be predicted that the subject's amount of response to exposure by the model is proportionate to the model's expressions, behavior, and verbalizations. In regards to this, a high response may be expected in the high experimental setting, a low response may be expected in the low experimental setting, and, little or no response may be expected in the control setting. With recent interest and modern technology such an approach to studying observational learning in young children seems very feasible.

A replication of this study could be undertaken using stimuli other than toys. For example, the medium of study could be food to broaden a child's preference toward a wider

variety of foods. Another medium of study could be to solve a problem by guidance in developing skills such as spontaneity and creativity. Or, the medium of study could be to learn and to enjoy water as a recreational activity as well as a sport. As such, research using adult modeling through vicarious positive reinforcement has innumerable possibilities.

The model may be a variable in studies on change in preference. By using models of both sexes research can be conducted to determine if the sex of the model makes a difference with all of the subjects, or, with same-sex or opposite-sex subjects. Although research having the subject choose the preferred model has been done before by Morris, Sharkey, and Redd (1979), more such research needs doing.

Another line of research could be to find out if new learning would be retained in the future. Initially, psychological factors such as novelty, curiosity, and attention may be used. The specific reinforcers and the degree each operates may vary depending on the particular study. Retention may be measured two weeks to a month later through a replication of the original study. Follow up investigations on retention can assist educators, parents, and those in the helping professions to determine which kinds of change are permanent.

Based on comments by Bandura and others, all of these recommendations for further study could use either filmed models, live models or a combination of filmed and live

models. Also, it seems that any age subject could participate.

Summary

For this study an attempt was made by the model to change the preferred toy of each subject by applying Bandura's observational learning theory. Three hypotheses were tested. First, the proportion of change due to the social modeling reinforcers assumed to be operating is expected to be in a descending order of probability from high to medium to low when comparing a high experimental, a low experimental, and a control setting. Second, the proportion of change in girls' preferences from their first choice toy to the critical toy is higher than the proportion of change in boy's preferences. And third, the proportion of change in younger children's preferences is higher than the proportion of change in older children's preferences.

An Early Childhood Development Center in Sacramento, California was chosen as the site. One hundred sixteen subjects were matched by sex and age then randomly assigned to three experimental settings--the high experimental, the low experimental, and the control. The age range of participating subjects was from 37 to 64 months, with a mean age of 53 months. The mean age of the older subjects was 59 months. The mean age of the younger subjects was 47 months. The experimenter, a female, was also the model. Three toys were used as the medium of study. They were felt shapes

with a flannel board, colored blocks to use on a tray, and golf tees to insert in a raised pegboard. Each toy had many pieces of three different sizes and six solid colors. A three by two by two factorial design was established to study the influence of social modeling, sex, and age. Each subject was taken individually to the experimental room where the three toys were displayed on a low table. The model demonstrated the use of each toy prior to having the subject rank-order the toys by the method of paired comparisons. Each subject's third choice toy was designated as the critical toy. The actual experiment lasted five minutes for those subjects who did not change to the critical toy, or less than five minutes for those who did. After the experiment, the subject was allowed to play with any of the three toys for a minute or two longer prior to helping the model put the toys away in their initial places and manner. The model then told the subject she enjoyed spending time with the subject, and, she walked the subject back to the classroom.

The four reinforcers of affect, reward, proximity/distance, and nurturance were jointly operating in a social modeling situation. Affect was defined as the model's degree of likes and preferences of fundamental characteristics or qualities of the critical toy such as novelty, size, color, and shape. This was indicated by the amount of pleasure the model affectively expressed through body actions, gestures, facial expressions, and

verbalizations to the subject. Reward also encompassed the likes and preferences of the critical toy by the model's manipulation of the various items, but, the process of drawing comparisons and making designs was an extension of merely indicating enjoyment. Reward was defined as the model's performing body actions and making remarks that were contingent upon the liking of a particular accomplishment. Rewards included such actions as drawing comparisons of the items within the critical toy on a cognitive level and/or by making a design by possibly arranging the items in a specific sequence that was aesthetic, mathematical, or pleasing and rewarding to the model in other ways. Proximity/distance was defined as the actual toy placement. Proximity was to encourage the subject to change to the critical toy more readily, whereas, distance was to discourage the subject from changing to the critical toy. Nurturance was defined as the degree of warmth, friendliness, and emotional support exhibited by the model while playing with the critical toy. The reinforcers, jointly administered in each setting, varied only in degree and frequency.

It is assumed that vicarious positive reinforcement was operating in the high experimental setting as the model only rewarded herself. Thus, high affect, high reward, proximity, and high nurturance were jointly operating. Low reinforcement was operating in the low experimental setting as the model neither rewarded herself nor the subject.

Thus, low affect, low reward, distance, and low nurturance were jointly operating. And, no reinforcement was operating in the control setting due to the model's absence from the experimental room.

Hypothesis 1 was supported by two statistical tests: the analysis of variance test followed by the Scheffe' method of multiple comparisons and the chi-square test. To elaborate on the results of Hypothesis 1, 54% of the subjects in the high experimental and 17% of the subjects in the low experimental and 11% of the subjects in the control setting changed to the critical toy. The data reveals that the greatest influence on changing the toy preferences of young children was due to the treatment, social modeling. The differences between these three treatment levels were significant at the .01 level. As expected, from examining the results of the Scheffe' method of multiple comparisons, vicarious positive reinforcement was the most effective treatment, followed by low reinforcement which was followed by no reinforcement. The most significant difference was between the high experimental and the control setting indicating that positive reinforcement is the most effective technique for changing preschool children's toy preferences.

Hypothesis 2, which states that the proportion of change in girls' preferences from their first choice toy to the critical toy is higher than the proportion of change in boys' preferences was not supported by either the

analysis of variance test or Pearson's chi-square test.

Hypothesis 3, which states that the proportion of change in younger children's preferences is higher than the proportion of change in older children's preferences, was not supported by either the analysis of variance test or Pearson's chi-square test.

APPENDIX A

TABLE SUMMARIZING RELATED RESEARCH ARTICLES CITED BY SUKEMUNE, HARUKI, AND KASHIWAGI (1977)

APPENDIX A

Table Summarizing Related Research Articles Cited

by Sukemune, Haruki, and Kashiwagi (1977)

Date	Bibliographic Source	Age of Subjects	Variables	Types of Social Learning Research
1966	Kobashigawa, A. Observationally induced disinhibition of inappropriately sex-typed responses in young children. *Japanese Journal of Educational Psychology*, 1966, **14**, 9-14. (Japanese with English summary)	Preschool	Avoidance of Inappropriately Sex-typed Toys	Content of Observational Learning— more specifically, Sex Role Behavior
1967	Kobashigawa, A. Avoidance of inappropriately sex-typed objects by kindergarten children through modeling. *Japanese Journal of Educational Psychology*, 1967, **15**, 34-41. (Japanese with Erglis ..ummary)	Kinder-garten	Avoidance of Inappropriately Sex-typed Objects (Toys)	Content of Observational Learning— more specifically, Sex Role Behavior
1968	Kobashigawa, A., & Kiyomura, T. Inhibition of feminine responses in kindergarten boys through modeling. *Japanese Journal of Educational Psychology*, 1968, **16**, 1-6. (Japanese with English summary)	Kinder-garten	Inhibition of Feminine Responses in Boys	Content of Observational Learning— more specifically, Sex Role Behavior
1968	Kiyomura, T., & Kobashigawa, A. Effects of feminine responses by a female model on observer boys. *Japanese Journal of Psychology*, 1968, **38**, 329-332. (Japanese)	Preschool	Avoidance of Sex-typed Toys	Content of Observational Learning— more specifically, Sex Role Behavior

Date	Bibliographic Source	Age of Subjects	Variables	Types of Social Learning Research
1968	Kobashigawa, A., & Kobashigawa, H. Effects of vicarious reinforcement and model's demonstration on a simple motor task with young children. *Japanese Journal of Educational Psychology*, 1968, **16**, 168-173. (Japanese with English summary)	Preschool	Relative Importance of Vicarious Reinforcement and the Model's Response Speed	Effects of Vicarious Reinforcement
1970	Kikuchi, R. Acquisition of secondary reinforcement characteristics through observation. *Proceedings of the 34th Annual Convention of Japanese Psychological Association*, 1970, p. 287. (Japanese)	Preschool	Acquisition of Secondary Reinforcement Characteristics	Learning by Observing vs Learning by Performing
1970	Takashima, K. A study of acquisition of aggressive behavior as a result of reinforcement. *Japanese Journal of Educational Psychology*, 1970, **18**, 139-148. (Japanese with English summary)	Preschool	Acquisition of Aggressive Behavior	Model's Characteristics: Relationship Between Model and Observer
1971	Sukemune, S., Toshima, T., & Inoue, M. Vicarious reinforcement and verbalization in observational learning in preschool children. *Japanese Journal of Psychology*, 1971, **42**, 44-48. (Japanese)	Preschool	Vicarious Reinforcement and Verbalization in Discrimination Learning	Effects of Verbalization on Observational Learning

Date	Bibliographic Source	Age of Subjects	Variables	Types of Social Learning Research
1973	Kikuchi, R. Acquisition of secondary reinforcement characteristics through observation. *Proceedings of the 37th Annual Convention of Japanese Psychological Association*, 1973, pp. 410-411. (Japanese)	Preschool	Acquisition of Secondary Reinforcement Characteristics	Learning by Observing vs Learning by Performing
1973	Sukemune, S., & Toshima, T. Analyses of model's and observer's response patterns in observational learning in preschool children. *Japanese Journal of Psychology*, 1973, **44**, 17-23. (Japanese with English summary)	Preschool	Model's and Observer's Response Patterns	Observer Learning
1973	Toshima, T., & Sukemune, S. Analyses of observational learning modes in preschool children. *Japanese Journal of Psychology*, 1973, **44**, 261-267. (Japanese with English summary)	Preschool	Observational Learning Modes	Analysis of the Mediational Process
1973	Matsuda, S. Effects of mother-child relationships on imitative behaviors of young children. *Japanese Journal of Psychology*, 1973, **44**, 79-82. (Japanese with English summary)	Preschool	Mother-child Relationships	Model's Characteristics: Relationship Between Model and Observer

Date	Bibliographic Source	Age of Subjects	Variables	Types of Social Learning Research
1973	Ushiyama, T. Effects of vicarious and direct reinforcement upon the occurrence of "jan-ken" behavior in kindergarten children. *Japanese Journal of Educational Psychology*, 1973, **21**, 79-89. (Japanese with English summary)	Kinder-garten	Vicarious and Direct Reinforcement	Content of Observational Learning— more specifically, Interpersonal Behavior
1974	Ushiyama, T. Facilitation and inhibition factors of choice of "jan-ken" behavior in kindergarten children. *Japanese Journal of Educational Psychology*, 1974, **22**, 105-109. (Japanese)	Kinder-garten	Facilitation and Inhibition of Choice Behavior	Content of Observational Learning— more specifically, Interpersonal Behavior
1974	Nagano, S., & Kashiwagi, K. Analyses of observational learning in memory tasks: Effects of performance and observation, and of labeling. *Proceedings of the 16th Annual Convention of Japanese Educational Psychology Association*, 1974, pp. 336-337. (Japanese)	Preschool	Performance, Observation, and Labeling	Learning by Observing vs Learning by Performing --- Effects of Verbalization on Observational Learning

Date	Bibliographic Source	Age of Subjects	Variables	Types of Social Learning Research
1974	Tamase, K., & Maeda, K. Observational learning in verbal conditioning situation. *Bulletin of Institute for Educational Research, Nara University of Education,* 1974, **10**, 29-41. (Japanese)	Preschool	Observational Learning	Effects of Vicarious Reinforcement Some Factors Underlying Modeling—more specifically, Gradually Increasing or Random Modeling Effects, and Modeling Effects of Correct and Incorrect Response Ratios
1975	Mochizuki, A., & Yokoyama, K. Observational learning and imitative response in preschool children. *Proceedings of the 39th Annual Convention of Japanese Psychological Association,* 1975, p. 270. (Japanese)	Preschool	Observational Learning and Imitative Response	Effects of Vicarious Reinforcement

Date	Bibliographic Source	Age of Subjects	Variables	Types of Social Learning Research
1975	Minami, K. Effects of modeling upon acquisition of sex role behavior in preschool children: Analyses of toy play. *Proceedings of the 39th Annual Convention of Japanese Psychological Association,* 1975, p. 279. (Japanese)	Preschool	Modeling and Aquisition of Sex Role Behavior	Content of Observational Learning— more specifically, Sex Role Behavior

Note. **Table summarizing the research articles cited by Sukemune, Haruki, and Kashiwagi (1977) that apply to this study. The articles chosen comply with as many delimitations as possible that were set for the related research. All of the original sources within their article are in Japanese. Therefore, only the variables studied and the headings used by the authors' of the article are indicated in order to avoid any misinterpretations by this author.**

APPENDIX B

PHOTOGRAPHS OF THE TOYS USED FOR THIS EXPERIMENT

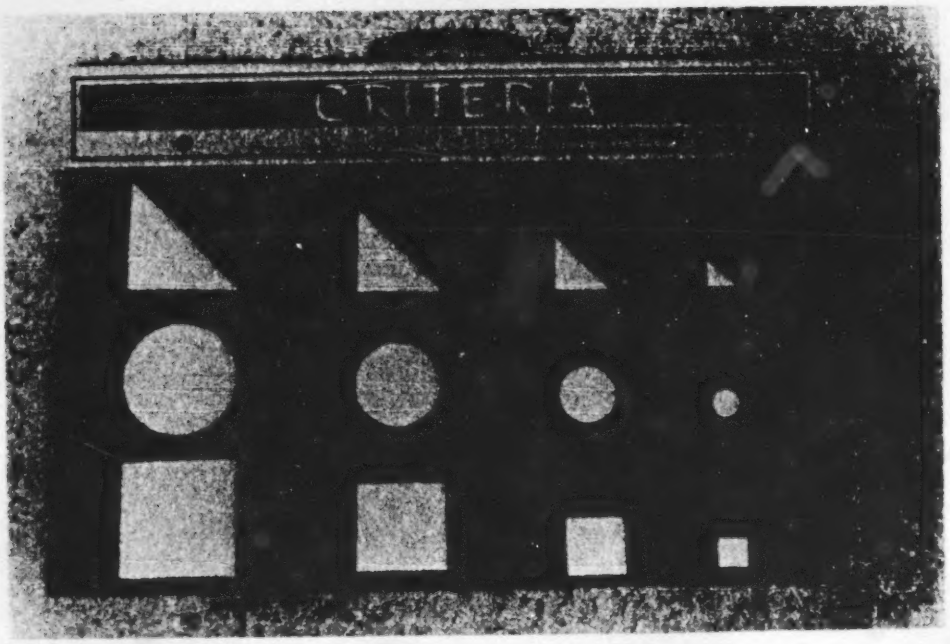

Figure 8. Items only, by size and shape, of the felt shape toy.

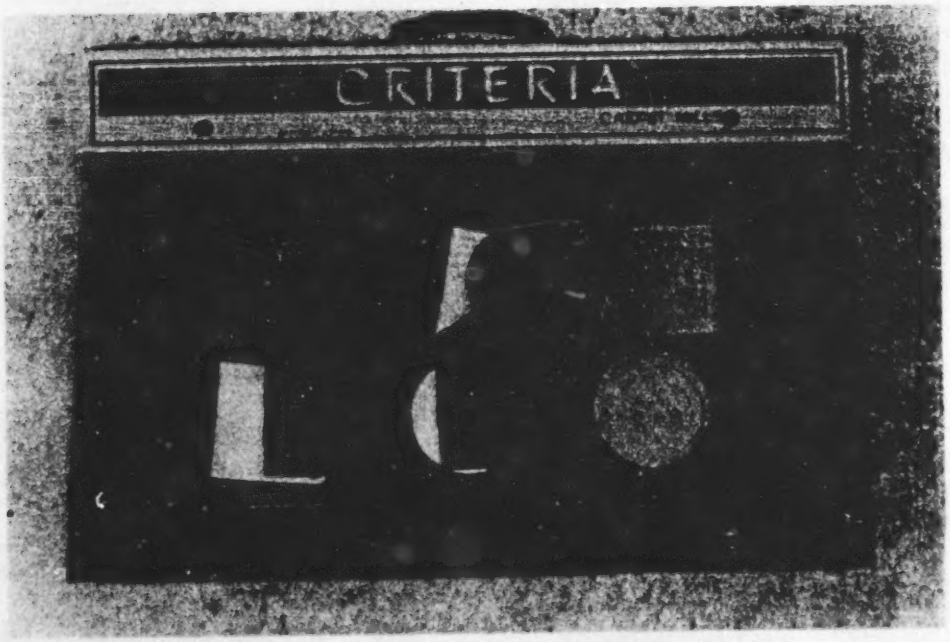

Figure 9. The felt shape toy, ready to use, with the tray in the center.

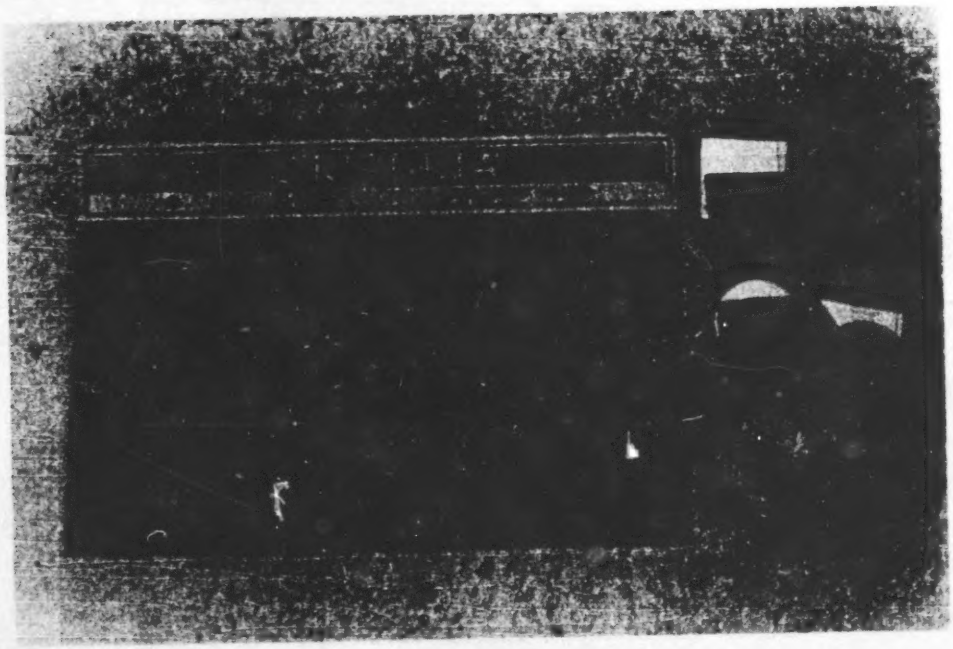

Figure 10. The felt shape toy, ready to use, with the tray to one side.

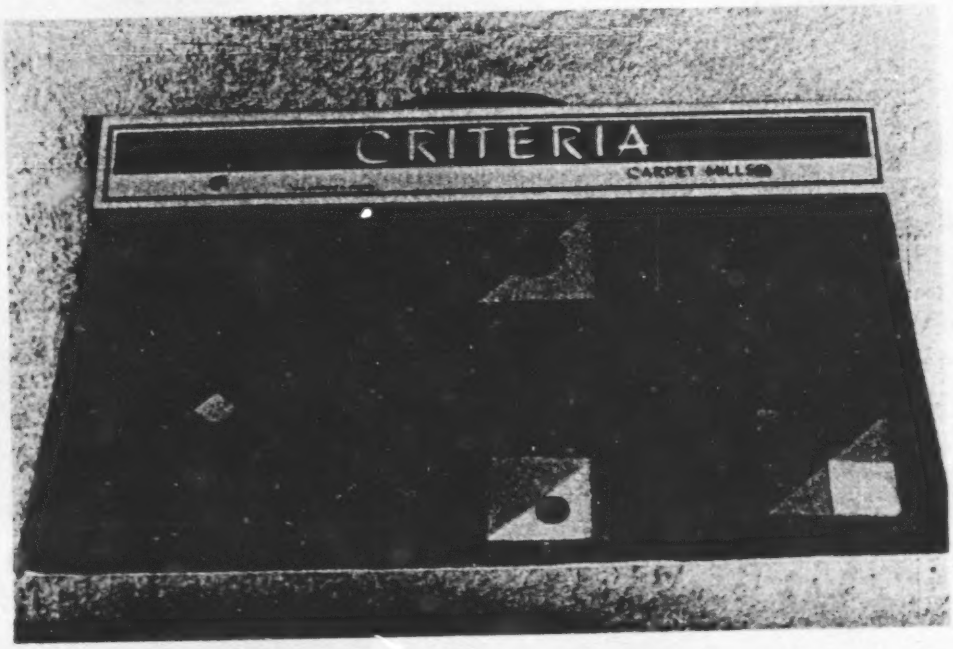

Figure 11. The felt shape toy, partially used.

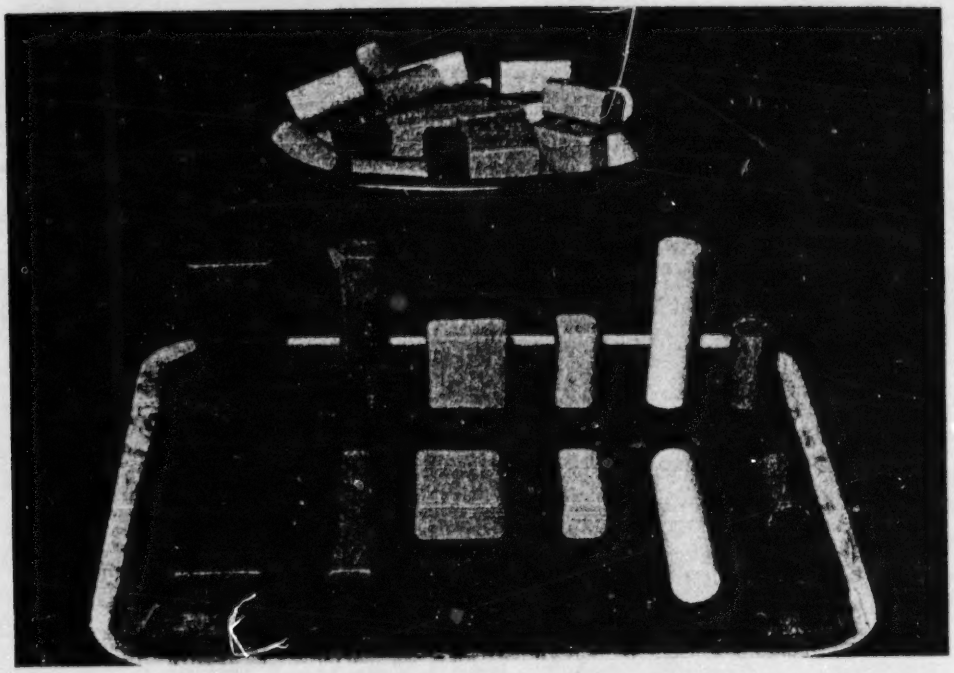

Figure 12. Items only, by size and shape, of the colored block toy.

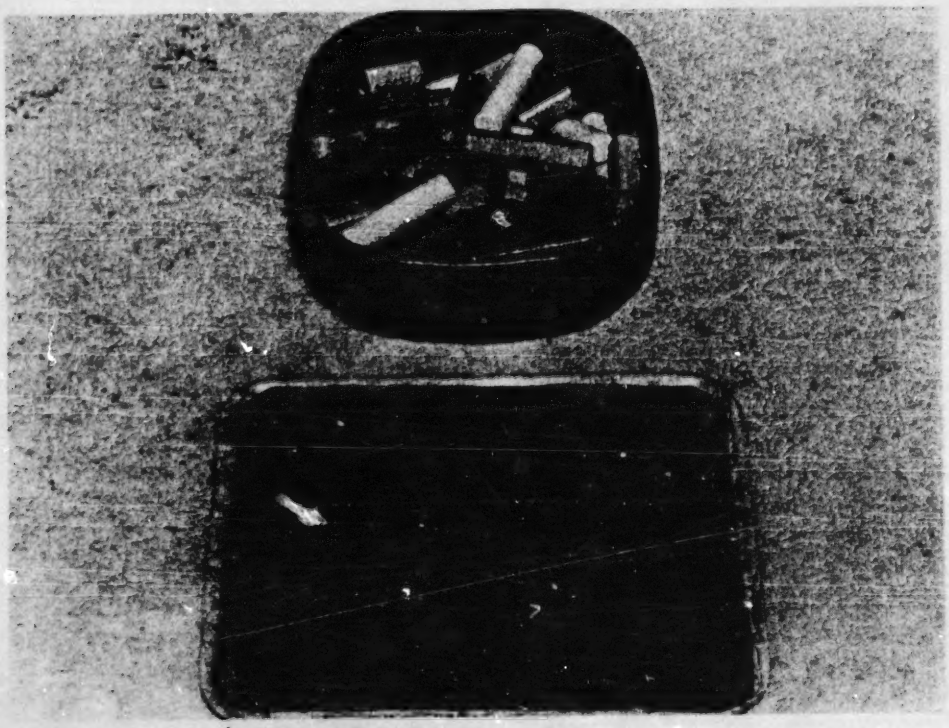

Figure 13. The colored block toy, ready to use.

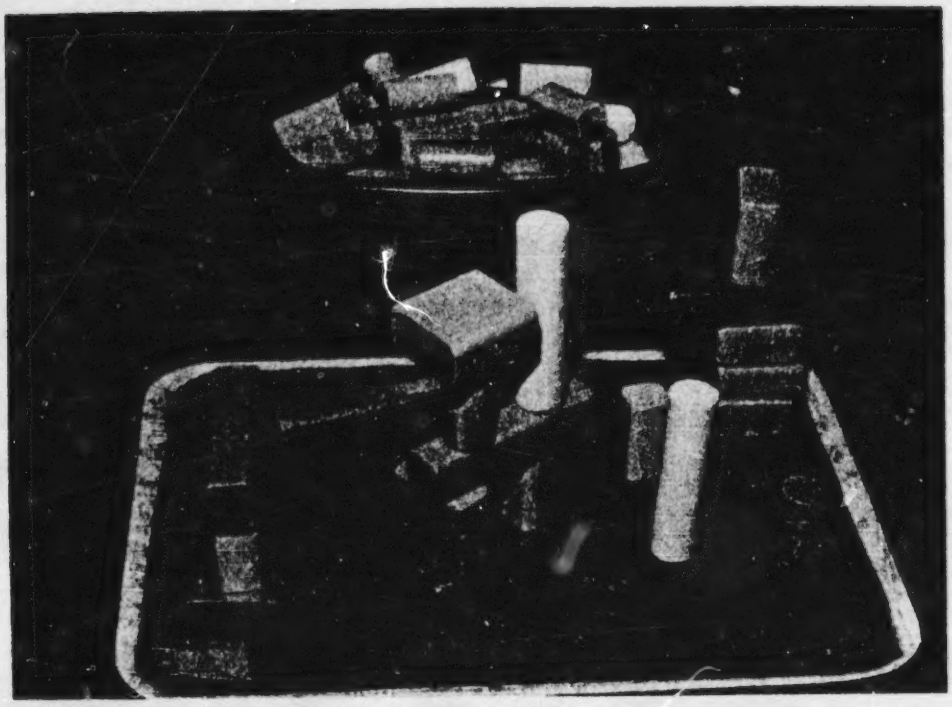

Figure 14. The colored block toy, partially used.

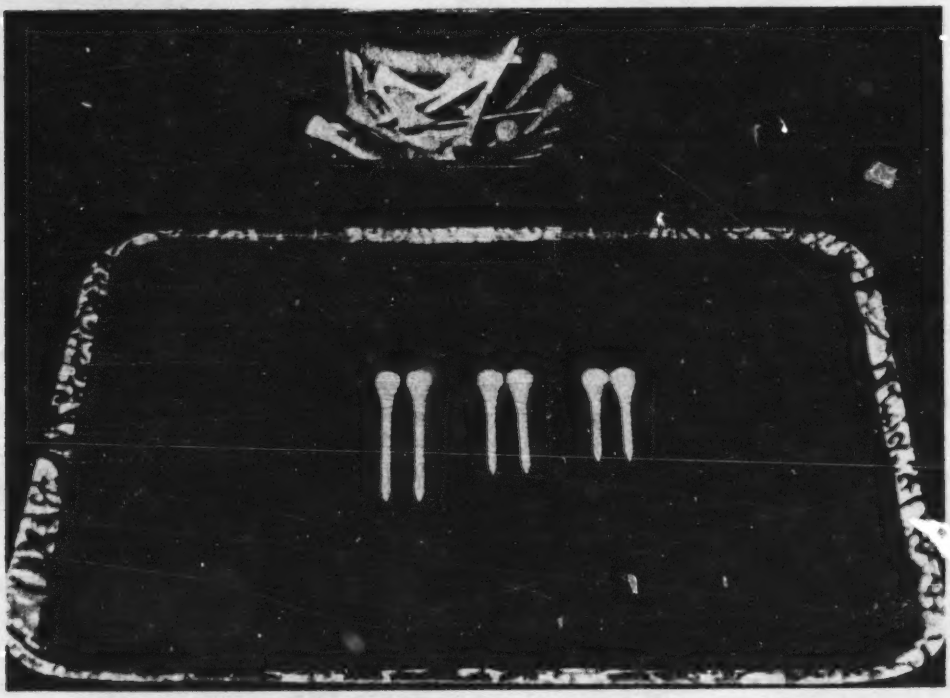

Figure 15. Items only, by size and shape, of the golf tee toy.

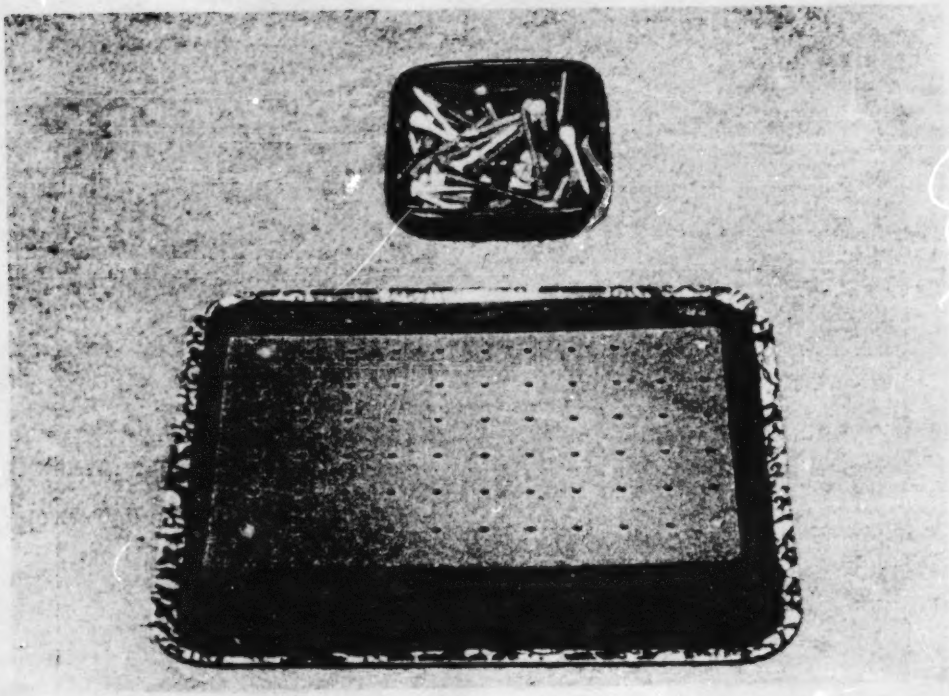

Figure 16. The golf tee toy, ready to use.

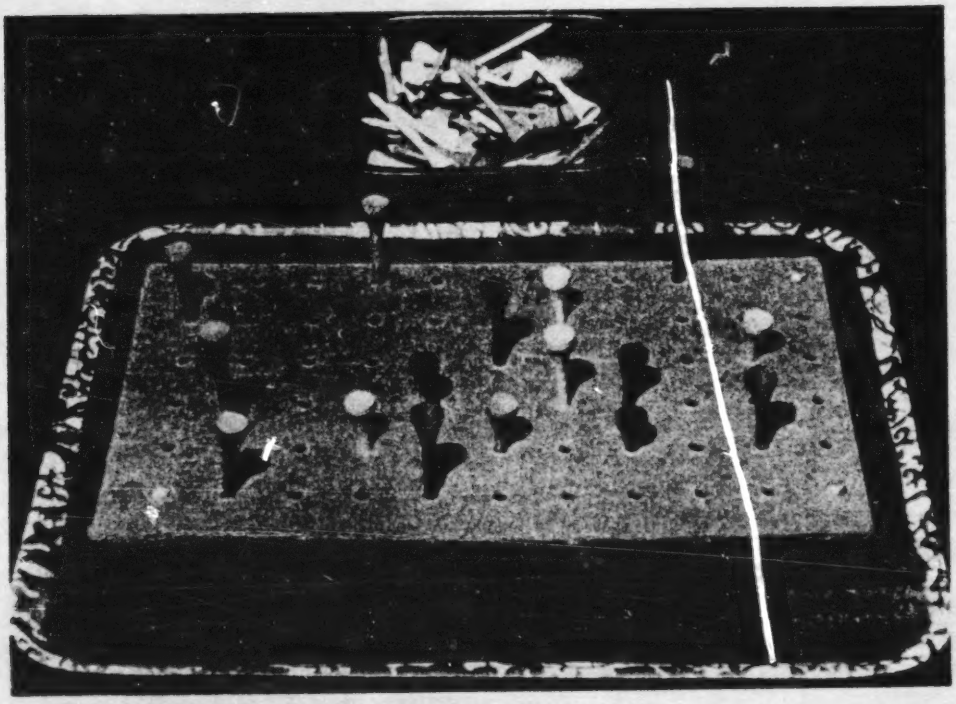

Figure 17. The golf tee toy, partially used.

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